

# braintainment

the magazine that surprises



## HOW LONG CAN YOU GO WITHOUT SLEEP?

*How do dolphins stay awake 24/7? p.48*



**How did Buddha amass millions of followers after his death?** p.40

## ENLIGHTENED PRINCE

## Technology, history, science plus:

- Strange Christmas traditions
- **Making concrete indestructible**
- Searching for mammoth tusks
- **The best ways to stay hydrated**

▪ Who killed Batman's parents?



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**PLUS**  
your questions answered and more ...

**REVEALED**  
The **secret** to accomplishing your **New Year's** resolution p.10

## Season of giving

*How does being a **good Samaritan** make you a **happier, healthier and smarter** person? p.18*

## Anger management

*What causes you to lose your cool?* p.66



## Epic fails

*Inventions that have made our lives miserable*



p.28



# How can you make batteries love dancing?

The demand for energy is rising fast. To help the world keep up, we are celebrating our 150th anniversary by co-creating smarter ways to harvest and generate energy, like using the footsteps on dance floors to charge clubbers' phones.

Join the conversation at [creator-space.basf.com](http://creator-space.basf.com)

150 years

 **BASF**

We create chemistry





## Dance of death

**A**n agile Capoeira performs to rhythmic beats in Sao Paulo, Brazil. Far from being just a form of entertainment, Capoeira is a Brazilian martial art that combines elements of dance, acrobatics and music. Introduced in the country by West African slaves, it is known for quick and complex moves, using mainly power, speed, and leverage for a wide variety of kicks, spins, and highly mobile techniques.



## Two sides of the coin

It's that time of the year again: the silly season. It's a time to enjoy the festivities, soak up the holiday atmosphere and let your hair down (within reason, of course). Also, have you ever noticed how much nicer people are around this time of year?

People seem a lot more polite and patient on the roads and in shopping centres. For a limited time, they fully embrace the spirit of giving, even going so far as to invite a perfect stranger to their New Year's Eve braai. What makes people behave in this manner? Is it the change of weather or the hullabaloo in the media and movies that mesmerises you into the spirit of giving? Whatever it is, it is most welcome.

Because, let's face it, most of us are getting angrier by the day. Blame it on the pressures of modern-day living or our need for instant gratification, but our fuses seem to have gotten shorter and our tolerance levels have dropped dramatically. In this issue, we analyse what causes many of us to become ticking time bombs. On the other hand, we also look at the effects of being a good Samaritan on your overall wellbeing – the positives and the negatives. It certainly is food for thought.

Wishing you a great holiday season and a great start to 2016.

PS: BRAAI INVITES CAN BE SENT TO BRAINTAINMENT@PANORAMA.CO.ZA.

Gerard Peter  
Editor-in-Chief



# this issue

**Psychology**

**Want to quit smoking? First think about what you will do if you start craving a cigarette**

## Happy new you

It's that time of the year again. You make a promise to better yourself. And this time you are adamant that you will stick to your goals. However, it's not that easy. Whether you're getting into shape or getting smoking, a large number of people simply can't keep to their New Year's resolutions. Why do so few plans work out and how do we prevent disappointment in the future?

**1 in 8** of people who make a resolution to quit smoking in January will be successful by the end of the year. That's according to a study by researchers at the University of California, San Diego. The study found that people who made a resolution to quit smoking in January were more likely to succeed than those who made a resolution to quit at any other time of the year. The researchers also found that people who made a resolution to quit smoking in January were more likely to stay quit for more than six months than those who made a resolution to quit at any other time of the year.

**Does Carr provide a cure?**

It's a common belief that Carr provides a cure for smoking. However, Carr is a placebo. It's a sugar pill that has no effect on the body. Carr is a placebo because it's a sugar pill that has no effect on the body. Carr is a placebo because it's a sugar pill that has no effect on the body.

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**PLUS**

All the questions you didn't know you wanted the answer to including:

- Why do older women prefer short hairstyles?
- What is the most consumed food product on Earth?
- What is considered the biggest sporting upset in history?
- Can people be allergic to each other?
- Why does your keyboard have 2 shift buttons?
- Where do honeymoon customs originate from?
- Why are there so many different heads on screws and bolts?
- When was the first traffic fine issued?
- Why do jazz and pop artists always play without score sheets while orchestras panic if they can't find their sheets?
- Why is February an intercalary month?
- Do overweight people have more blood than thinner individuals?
- Could your finger or hand die if you sleep on it?
- Why do men have sweaty feet more often than women?
- Where does the term 'junk food' originate?





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the magazine that surprises

Quest for knowledge

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### Immediate impact

Dear editor

Your latest issue caught my eye on shelf. I picked it up and was an immediate fan. I see that it is a 'Best of' issue and now my curiosity is piqued. Is there any way I can get my hands on all the back issues?

Cynthia Roberts, Paarl

You certainly can – simply visit [coolmags.com](http://coolmags.com) and get back copies as easy as pi. Also follow us on facebook. [com/braintainment](http://com/braintainment) for subscriber specials.



### School's in

Dear Braintainment

I just wanted to let you know that it's not only adults who read your magazine. My mom buys it for my dad and I often take it to school when he's done to show my friends. We all love reading about cool stuff like time travel and science experiments.

Greg van Zyl (12),  
Johannesburg

What will delight you is our bumper January 2016 issue that features answers to the questions you never thought

you wanted to know the answers to. We also bring you quirky tidbits on science, technology, history and more that will make it cool to go back to school.

### This is no yolk

Dear Braintainment  
Thanks for a fantastic, informative magazine. I particularly enjoy the articles that focus on psychology and parenting. But for now I have a question about an animal. I have always considered chickens to be rather funny-looking, especially the red parts on their heads. What is the purpose of these red, floppy bits?

Samantha Jones, Johannesburg

The red bit on top of a chicken's head is called a comb, while the part that hangs from the throat is called the wattle. Together these parts form what is called a caruncle. The caruncle is mostly ornamental, and is used by the male to attract hens to breeding. It is thought that the hen will choose which cock to have chicks with based on his caruncle. Also, in males a large caruncle can demonstrate high testosterone levels.





**Questions, suggestions or observations? Share them with us:**

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Please include your name and address. The editor reserves the right to shorten and edit letters.

**Planton after:** Best enjoyed fried in a deep oil.



Although they look a lot like green bananas and are a close relative, plantains are very different. They are starchy, not sweet, and they are used as a vegetable in many recipes, especially in Latin America and Africa. Plantains usually resemble green bananas while ripe plantains may be black in colour. Plantains are longer than bananas and they have thicker skins.

Source: grabemsnacks.com

**Planton before:** Looks like a banana but could give you indigestion if eaten raw.



**A slippery question**

■ What is the difference between a banana and a plantain?  
Kgadi Nxongo, via email

Plantains are a member of the banana family. They are a starchy, low in sugar variety

that is cooked before serving as it is unsuitable raw. It is used in many savoury dishes somewhat like a potato would be used and is very popular in Western Africa and the Caribbean countries. It is usually fried or baked. Eating it raw may lead to indigestion.



**Parent trap**

Who killed Batman's parents?  
DM Parmelo, via email

According to our resident comic historian Fred Kayembe, it was Joe Chill, a fictional character introduced in the DC Comics Batman series in 1940. He murdered young Bruce Wayne's parents, thus making him indirectly responsible for

Batman's existence.

Not much is known about Chill, except that he appears to be a petty mugger who kills Thomas and Martha Wayne in front of their child, Bruce, while trying to take their money and jewellery. Bruce, unflinchingly glaring at him, begins crying and calling for help. Chill panics and runs from the scene. Bruce would always remember the murderer's face.

**Is there ever a right way?**

■ I would like to give you a little feedback on your Parenting 101 article. Firstly, thank you for bringing these facts to light. My daughter, age 11, has been raised on Alfie Kohn's methods. I think one just needs to be aware that she is her authentic self, but it's not always what I want her to be. Yes, she is honest to the core, and most of the 'rude' behaviour is just an honest reflection of my own poor example. This method is hard work. And parents need a very high value system to be confident in the outcome. I sometimes



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wonder if this is the right way to raise a child and wonder if I have created a monster?

Kathryn Dietrichsen, via email





## ■ SCIENCE

### Ancient coelacanth nursery

**V**arious specimens of Africa's earliest coelacanth have been found in a 360-million-year-old fossil estuary near Grahamstown, in South Africa's Eastern Cape.

More than 30 complete specimens of the new fossil species, *Serenichthys kowiensis*, were collected from the famous Late Devonian-aged Waterloo Farm locality, by palaeontologist Dr Robert Gess and described by him in collaboration with Professor Michael Coates of the University of Chicago. "Remarkably, all of the delicate whole fish impressions represent juveniles. This suggests that *Serenichthys* was using a shallow, waterweed-filled embayment of the estuary as a nursery, as many fish do today," stated Gess. The fossils come from black shales originally disturbed by road works at Waterloo Farm. These shales are the petrified compacted remains of mud, which was deposited in the quiet reaches of an estuary not unlike some of those along the Eastern Cape coast today.

"This earliest known record of a coelacanth nursery foreshadows a much younger counterpart, known from the 300-million-year-old Mazon Creek beds of Illinois in the United States," added Gess.

Coelacanths are believed to have arisen during the Devonian Period (about 5 million years ago), however only five species of reconstructable Devonian coelacanths have previously been described, in addition to a number of very fragmentary remains. None of these came from Africa, but rather from North America, Europe, China and Australia. The new species gives important additional information on the early evolution of coelacanths.

SOURCE: SUPPLIED



## ■ TECHNOLOGY

### Robotic fashion police

**S**panish scientists have developed a mathematical model that can give people fashion advice by analysing the latest season trends.

The system uses an algorithm to generate a score on how fashionable or unfashionable an outfit is. The robot was developed by Spain's Institute of Robotics and Industrial Informatics, along with

colleagues at the University of Toronto. It uses data from 144,000 user posts from the fashion website [www.chictopia.com](http://www.chictopia.com). The site allows users to publish pictures of themselves wearing new outfits, along with the outfit description.

A neural network, alongside a 'conditional random field', is used to transform the information from

the site into an algorithm for trendiness. This also considers factors such as location and weather. The system is able to tell how an outfit can change according to age, weather and even the type of city in which you live. The system can tell the person how fashionable they look and can also give other fashion advice.

SOURCE: DAILY MAIL





■ HEALTH

## Pulling the plug on cancer

**I**s it possible to 'switch off' cancer? Scientists from Florida believe so and recently announced that they have found a code that can 'turn off' cancer. This is according to a report in UK newspaper *Daily Mail*. During an experiment, they were able to make cancerous breast and bladder cells turn benign again. This new work could promise a new strategy for cancer therapy. Conventional cancer drugs aim to kill cancer, whereas the

new research aims to rather deactivate it. Although still in the early stages, scientists are feeling optimistic about the new research. The breakthrough focuses on a protein called PLEKHA7, which helps group healthy cells together. Scientists from the Mayo Clinic in Florida show the protein to be missing or faulty in a range of cancers. Genetic instructions to the cells are then scrambled and as a result, the cells turn

cancerous. During experiments conducted in a dish, human cells from dangerous bladder cancers were made normal again. The team thinks that the approach will apply to most cancers, but not to brain and blood cancers. More research is needed before the technique can be tested on people. It is likely that patients will still need chemotherapy, even if the new therapy does help.

■ CULTURE

## Nessie is just a catfish – expert

**A**fter nearly a quarter century of camping out by the banks of Scotland's Loch Ness hoping to glimpse 'Nessie', the most dedicated hunter of the legendary monster has given up, concluding it is just a very big catfish.

Steve Feltham, who gave up his girlfriend, house and job in southwest England in 1991 to spend his life looking for the Loch Ness monster,

believes he has solved the mystery behind its many sightings. Rather than being a primeval beast, he suspects it is a Wels catfish, a native European catfish that could grow up to 4m long. Victorians introduced the fish to the dark waters of the loch to provide sport. His conclusions are unlikely to deter the thousands of tourists who visit the site and believe a monster does still lurk in the dark waters of the deep



Scottish lake. The first written record of the monster relates to the Irish monk St Columba, who is fabled to have banished a 'water beast' to the depths of the River Ness in the sixth century, long before the introduction of the catfish to the loch. There have been countless fruitless

attempts to track down the monster in the years since. In 2003, the BBC funded an extensive scientific search that used 600 sonar beams and satellite tracking to sweep the full length of the loch. It concluded there was probably nothing there.

SOURCE: HUFFINGTON POST





It's only an honest swap when everyone's watching...

SABINE JOOSTEN/HH

## ■ PSYCHOLOGY

### Seeing is believing

Children are just like adults when it comes to trust – so it seems from research at Yale University (USA). Psychologists conducted an experiment with 5-year-old children. In the test, children were allowed to give 1 of 4 stickers to a peer. The youngsters were more generous if they could see the other child, as opposed to not seeing them. The children were also more generous if the stickers were placed in a transparent container. They shared less if the container was not transparent. It's a well researched fact that adults behave better if they know that they are being watched. Researchers say that this experiment reveals that children already show this type of strategic behaviour at a young age.



## ■ HEALTH

### Sperm on tap

**N**eed sperm? No worries. Men, you no longer have to read erotic magazines to do your deed at a fertility clinic. Scientists at The University of Zhengzhou (China) have made an extraction device that they believe can drain sperm efficiently. The device looks a bit like a phone booth. However, instead of a phone,

it has a screen that broadcasts a 'stimulating' video. Meanwhile, a pink rubber tube moves up and down at hip height. The user can place his private parts (complete with condom) inside the tube. The temperature and speed of the tube can be adjusted manually during the session.

This is a lot faster and more hygienic than by hand, according to the inventors. The sperm extractor is already in use in the fertility clinic at the Central Hospital of Zhengzhou in China. Want to see what it looks like? Go to [Quest.nl/spermatap](http://Quest.nl/spermatap) to watch the video.



## ■ BODY

### It's easier to walk naked

**I**t looks cute when a baby waddles in his nappy. However, a nappy could get in the way when you're learning to walk. Psychologist Whitney Cole of New York University invited a group of children – aged 13

and 19 months – to the university to walk a few metres for the good of science. Some children walked naked, others with disposable nappies, and the rest walked with a cotton nappy. Guess what? The

children without nappies walked straighter and fell less. However, Cole doesn't dare say if it is better to learn to walk starkers. For now, we suggest teaching the little one to walk with a nappy to avoid messy situations.



O. JOHNSON/CORBIS

## Shorts Ahead of the curve

- Children who wear thick winter clothes or sleep under heavy blankets crawl less quickly, researchers discovered.
- About 40% of American children never crawled in the 19th century, possibly because it was customary to clothe babies in long robes in those days.





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## Want to quit smoking? First think about what you will do if you start craving a cigarette

# Happy new you

*It's that time of the year again. You make a promise to better yourself. And this time you are adamant that you will stick to your goals. However, it's not that easy. Whether intent on getting into shape or quitting smoking, a large number of people simply can't keep to their New Year's resolutions. Why do so few plans work out and how do we prevent disappointment in the future?*

■ TEXT: BERRY OVERVELDE

### Does Carr provide a cure?

In order to stop a bad habit you have to realise that this habit has no function for you (even though you think it has), says social psychologist Arie Dijkstra of the University of Groningen. This will sound familiar to many (wannabe) ex-smokers. Allen Carr (1934-2006) was a chain smoker who became an anti-smoking guru before he died from lung cancer. The Englishman helped smokers get rid of a function, for instance, "It helps me relax." That makes sense because there have been countless moments when you thought puffing on a cigarette did something good for you. As

the cigarette does nothing but depress the withdrawal symptoms, Carr looked at what people shouldn't do (such as thinking that smoking brings them something good), and not what they should do. To change your behaviour you need 2 types of forces. The first is the force to kick the habit of those functions. This makes you not want to display this behaviour anymore. This is what Carr did. The second force is motivation. This makes that you really want to carry out your new behaviour. An example of this could be the desire to climb the stairs without huffing and puffing.

#### ● Everything can go wrong

A change of behaviour consists of 3 steps, according to Arie Dijkstra. He is a professor of social psychology at the University of Groningen (NL) and specialises in helping smokers kick the habit. The 'motivational process' is the first step, according to Dijkstra. What makes you want to change your behaviour? Are you fed up with gasping for air when

climbing up a flight of stairs? The 'planning process' is step 2. What is involved in the plan to change? To visit the gym, for instance. The last step is the 'learning process': learning to deal with the discomfort and disadvantages this goal requires, such as 'compulsory' exercise. Something can go wrong in every step. Take motivation. What could be wrong with





the wish to lose some weight? Dijkstra explains: "It happens when the motivation comes from an external source. For example, if your partner's nagging is the reason that you want to lose a few kilos, then you will soon forget why you embarked on achieving this goal in the first place. Only when the motivation comes from yourself will you feel the urge to change," he says.

#### ● Planning is difficult

Let's assume that your motivation is in order. Then you are still not even close. Your planning could fail. Dijkstra adds: "You have to prepare well for a behavioural change. Imagine what it will be like to leave that cigarette when you are craving for one. Determine how you will react in such a situation. Imagine beforehand what you are going to do when



## 1 in 8

**F**ew successful are people when it comes to sticking to New Year's resolutions? Richard Wiseman, professor at the University of Hertfordshire (UK), found out in 2007. He asked about 3,000 people who had

made such resolutions. This varied from losing weight to drinking less. Beforehand about 52% were convinced that they were going to succeed. However, a year later it appeared that only 12% had reached their goal.

you feel like smoking a cigarette." Even during the learning process things can go wrong. Suppose you quit smoking. You no longer crave a cigarette, but in the meanwhile you can't stop coughing. If you can't deal with this temporary disadvantage, chances are that your attempt to stop smoking will fail. Also, suppose you are having a bad day at the office and decide to take a puff. You might think that you have failed to keep your resolution. Dijkstra advises not to decide to quit smoking completely. Rather, learn to stop over the course of the next 2 years. Experiences like coughing without the comfort of a cigarette are part of learning to deal with behavioural change during those 2 years.

#### ● Kicking the habit

Even when you are motivated well, you make good plans for change and you can deal with difficult moments, success is not guaranteed. When trying to change bad behaviour, the 'function' of this behaviour, in Dijkstra's words, could be quite a hurdle. What is such a function? You smoke, for example, because it relaxes you. "The stronger the function, the stronger the previously mentioned processes are

undermined. Your motivation becomes less strong and you will not learn properly. That is why, especially with smoking, it is important to realise that these functions only exist in your head. Teaching yourself a new behaviour, like going to the gym for example, will cause problems other than stopping the behaviour. How successful you will be depends on how difficult it is to break barriers."

#### ● Is there any point?

Is the making of a New Year's resolution totally senseless if it is doomed for failure from the start? That is a little too negative because some people do succeed. Statistics show that about 10% of quitters don't touch cigarettes for a year or longer. But why wait until 1 January? Can't you just start on any random morning? According to Dijkstra, someone who has had enough of his smoker's cough can use 1 January as an excuse to not have to stop for now. Still, he encourages people to take part in the New Year's resolution circus of the first of January. "It is a social push that we all need. You also know that you are not alone. And that can just give you the push you need to live a healthier life." ■

[braintainment@panorama.co.za](mailto:braintainment@panorama.co.za)





## HEALTH

### Spick and span not as safe as you think

Over the last three decades, the number of children diagnosed with eczema in the United Kingdom has tripled. The latest figures from the National Eczema Society show that one in five children suffers from the skin condition. Experts believe that overly clean houses are contributing to the rise in eczema. The theory is that 'ultra-cleanliness' can disrupt the healthy development of immune systems in children. Eczema is a chronic skin

condition that typically starts in childhood. The condition causes patches of skin to become dry and itchy. If not treated, outbreaks can cause bleeding, infection, crust-over and extreme discomfort. The distinctive itchy patches are a sign that your immune system has overreacted to allergens, which then triggers the inflammatory process. The 'hygiene hypothesis' is a theory that is based on the belief that early exposure to bugs and bacteria promotes

immune system development, so that it does not overreact to innocent substances. A recent Swedish study revealed that children who use or eat off dishes that are washed by hand, and not in a dishwasher, are less likely to develop eczema. Washing dishes by hand is not as effective as a dishwasher, meaning that children are more exposed to bacteria, which ultimately boosts their immune systems.

SOURCE: MIRROR.CO.UK

## SCIENCE

### In the name of science

A Cornell University graduate student who allowed honeybees to sting him in 25 places and a group of scientists who concluded it's possible for one man to father 888 children are among the winners of the 2015 Ig Nobels, which honour humorous scientific achievements. Michael Smith estimates he was stung about 200 times during his 2012 honeybee study. His conclusion: The three most painful places to get stung are the nostril,

the upper lip and the male sex organ. Other winners being honoured at the recent 25th annual ceremony at Harvard University include a trio of linguists who discovered that almost every language in the world uses the word 'huh' for clarification in a conversation. Real Nobel laureates handed out the prizes, and each winner received a cash award: a Zimbabwean 10 trillion dollar bill, the equivalent of a couple of US dollars.

SOURCE: HUFFINGTON POST



## ENVIRONMENT

### Snakebite antidote is running out

The world is running out of one of the most effective snakebite treatments, putting tens of thousands of lives at risk, warn experts.

Medicins Sans Frontieres says new stocks of Fav-Afrique, which neutralises 10 different snakebites that can occur in sub-Saharan Africa, are desperately needed. The last batch will expire in June 2016 and there is no comparable replacement. Fav-Afrique is the only anti-venom that has been

proven safe and effective to treat envenoming from different types of snakes across sub-Saharan Africa, it says.

Each year, an estimated five million people worldwide are bitten by snakes, out of whom 100,000 die and 400,000 are permanently disabled or disfigured. In sub-Saharan Africa alone, 30,000 people die from snakebites every year and an estimated 8,000 undergo amputations.

SOURCE: BBC.COM





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GETTY IMAGES

Once a worldwide pandemic, smallpox has virtually been wiped out.



SIA KAMBOL/AFP/ANP

## Who causes more fatalities, man or nature?

Ruan Fourie, Bloemfontein

**W**e can't win against nature. Although it is difficult to have accurate numbers, disease, drought and disasters have probably caused more fatalities than mankind has. Smallpox alone, for example, claimed between 300 and 500 million victims in the 20th century. And that is just 1 disease. By comparison: WWI and WWII together cost the lives of between 50 and 150 million people. Drought and the plague decimated the European population regularly in the Middle Ages. Still, there are human inventions that come close. For example, smoking claims the lives of about 5 million people worldwide every year. There are about 650 million people worldwide who smoke at this moment, of which half of them will die as a result of this habit.



STEVE GOSWELLS/SP/L/ANP

## Why are your intestines not digested just as meat is?

Zaf Khan, Laudium

**T**his is because your intestinal wall is covered with a thick layer of slime. This layer ensures that bacteria that break down the meat cannot get to the intestinal walls. Besides, the meat that lands in your intestines is no longer meat. The digestion process begins in your mouth, but

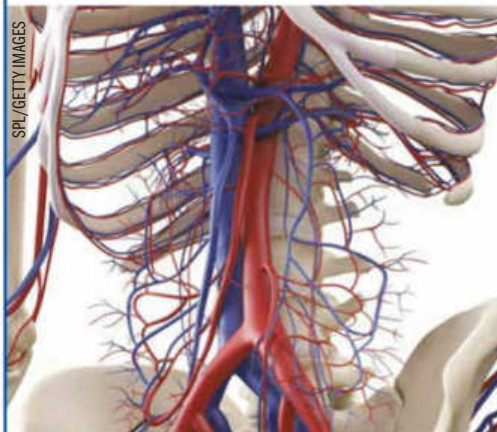
moves really fast in the stomach. The acid and stomach juices break down the meat to a large degree. Also, other digestive enzymes are added in the small intestines that break down the meat even further. The bacteria in the colon will feast on whatever is left of your piece of meat.

## Do overweight or large people have the same amount of blood as thinner individuals?

Anthony Birkholtz, Durban

**T**he more you weigh, the more blood you have. Blood supplies your body parts with oxygen and food, and drains waste substances. Fat needs less blood than muscles or organs, because it doesn't do much that requires blood. That said, fat cannot be completely without

blood supply. So when the amount of fat increases, new veins and capillaries grow in that extra fat. As such, the total amount of blood that circulates in your body also increases. For every extra kilogram of weight the amount of blood in your body increases by about 1%.



SP/L/GETTY IMAGES

## Q&A FLASH

- A baby is born with about 300 to 400ml of blood.
- Your heart pumps your entire blood supply around your body in 1 minute.
- The average adult has some 5l in their body and this constitutes 7% of your body weight.



# Could your finger or hand die if you sleep on it?

Ivan Kok, Johannesburg

**N**o, that is impossible. You can wake up with pins and needles in your hand or arm because a nerve was pinched. However, a body part can only die off when the blood supply is almost completely closed off for a longer period and this will never happen when you lie on it. A nerve can get damaged when it has been pinched for a long period. Usually, you will move around enough in your sleep to prevent this. But with

people who are very drunk or under the influence of drugs this moving around is sometimes suppressed. The singer of heavy metal band Megadeth, Dave Mustaine, fell asleep with his arm over a chair in 2002. A nerve was damaged to the extent that he needed 4 months of physiotherapy before he could play his guitar again.



# How is it possible that we have images of our entire galaxy?

Bronwen Strydom, Free State

**T**hat is not possible. What you may have seen are not photos but probably artist impressions. These are images created by an artist to create an impression of how the galaxy would look from the outside.

The galaxy looks very different from Earth. All stars that we can detect with the naked eye are part of the galaxy. The closest are seen as loose stars. We can see stars at a greater distance as a luminous belt in the

sky when it is dark enough. Why do we see a belt and isn't the sky completely lit? That's because the shape of the galaxy is more or less like a disc. The majority of the stars are found on the flat surface.

## Q&A **FLASH**

- The galaxy contains about 200 billion stars.
- It is estimated that there are some 8,8 billion Earth-like planets where life could be possible in the galaxy.
- It is estimated that there are between 100 and 500 billion galaxies in space.

ESO/NASA



Got questions you've been carrying around for years? *Braintainment* answers them! Mail your questions to [braintainment@panorama.co.za](mailto:braintainment@panorama.co.za)

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11	12	13	14	15
27	28	29	1	2
Lunedì Monday Lundi Montag Lunes	Martedì Tuesday Mardi Dienstag Martes	Mercoledì Wednesday Mercredi	Giovedì Thursday Jeudi Donnerstag Jueves	Venerdì Friday Vendredi Freitag Viernes

## Why is February an intercalary month?

Amanda Alats, Johannesburg

**T**his is because February used to be the last month of the year. In Roman times the year started in spring, with the month of March, and ended with February. The calendar was not quite right in those days, because the exact rotation of the Earth around the sun was unknown. The calendar year was therefore shorter than the actual year whereby the months moved up a little as opposed to the seasons. To solve this problem the Romans now and then added a few days to the year. This happened at the end of the year, which made February longer or shorter. It was only when the Ancient Egyptians determined the length of a year more accurately (namely 365.25 days), that it became clear that once in 4 years an extra calendar day had to be added. The Romans did this again at the end of their year that ended in February.

## Q&A FLASH

- A year is actually 365.2421875 days. Adding a leap day once in 4 years, so that the year is 366 days, is a little too much.
- The extra 12 minutes that we have added on our calendar amounts to 3 days per 400 years.
- The month of February in 1700, 1800 and 1900 didn't have 29 days. But February in 2000 did.



SHUTTERSTOCK

## Where does the term 'junk food' originate?

Samantha Booysen, Cape Town

**T**he very first person to use this term was Michael Jacobson in 1972, then president of the American Centre for Science and Public Interest. He used

the term for food that contains a lot of calories, but hardly any useful nutrition such as protein, vitamins and minerals. Junk is another word for



SHUTTERSTOCK

## Why do men have sweaty feet more often than women?

Mauray Els, Pretoria

**M**en not only have sweaty feet more often, they sweat more than women over their whole body. Women need less sweat to cool down. They are on average smaller and their exercise capacity is lower. Also, women appear to sweat more efficiently than men. Their sweat is spread all over their body whereby they have to sweat less to cool down.

Also, a female body takes longer to begin to sweat. That said, women warm up faster during exercise than men. According to Japanese scientists of the Osaka International University, who discovered this, women sweat less because their bodies contain less water. This makes them more susceptible to dehydration.



JEAN-ERICK PASQUIER/GETTY IMAGES



## O&A FLASH

- According to a study by pharmaceutical company GlaxoSmithKline, South Africa has the highest overweight and obesity rate in sub-Saharan Africa.
- Seven out of 10 women and 4 out of 10 men have significantly more body fat than what is deemed healthy.
- According to the study of the 70% of overweight South African women, 42% are obese.

SOURCE: MG.CO.ZA

worthless goods or material. Jacobson also came up with the term 'empty calorie'. This word combination has no set definition, but is mostly used for chips,

pizza, candy and fizzy drinks. The products are not unhealthy in a balanced diet, but often lead to a surplus of calories that can result in weight gain.



SSPL/GETTY IMAGES

## How did they light candles where there were no matches or lighters available?

Nick van den Berg, Johannesburg

**T**hey used a tinderbox, the predecessor of safety matches. This box contained tinder: a light, flammable material. Using flint, a person would hit along a piece of metal to get a spark. When the sparks would fall on the tinder it would smoulder. A flame would ignite if you blew a little. But usually there was not that much fuss. It was normal to have a fire going the whole day in most households. The fire was covered with a layer of ashes so that it would smoulder a bit. In the morning the fire would be started again. There were always smouldering coals that you could use to start your fire again.

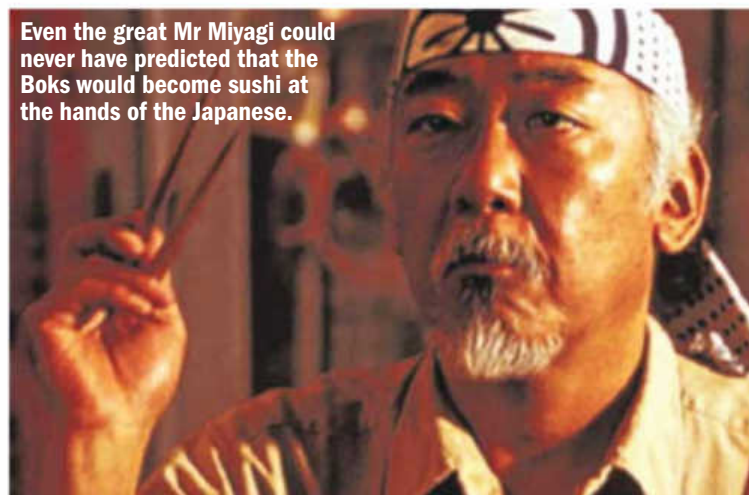
## What is considered the biggest sporting upset in history?

Clive Jenkins, Bloemfontein

**T**his is a hard one to pin down as it would depend on the global appeal of the sport. For South Africans 19 September 2015 is one day they would sooner erase from their sporting history. It was on this date that a highly unfancied Japanese side beat the Springboks 34-32 in the Rugby World Cup, easily causing the biggest upset in that sport's history. However, this may have been eclipsed by Italian Roberta Vinci at the US

Open tennis championship. Vinci, a 300-1 longshot entering the tournament, upset No. 1 Serena Williams in 3 sets in the US Open women's semi-finals on the previous Friday, ending Williams's hopes of completing the calendar Grand Slam. Vinci won the match 2-6, 6-4, 6-4 over Williams, who had won 4 straight Grand Slams and the last 3 US Opens. It is now considered one of the greatest upsets in sports history.

Even the great Mr Miyagi could never have predicted that the Boks would become sushi at the hands of the Japanese.





## Changing the world begins at home

# Give and take

*Doing a good turn for somebody else requires time and effort. However, it is not wasted. That's because apart from making them happy, there is a yield for you too. Here are 5 good deeds that will help make you a better person.*

■ TEXT: CARLLIN SIMONS

### Tip 1. Collect money

**The deed** We admit that walking around with a tin can collecting donations for the elderly on a Saturday afternoon will cost you a chunk of your weekend. Yes, you might have to make this sacrifice in order to uplift the welfare of others, but it also benefits you.

**The yield** Volunteer work is healthy. This was discovered by researchers at the Cornell University School of Medicine (USA) by

following 427 married women for 30 years. In the group who never lifted a finger towards volunteer work, 52% developed a serious disease, while only 36% of those who did volunteer work suffered the same fate. This positive effect on health also appears in different studies. Volunteers, especially those older than 65, appeared to stay alive longer than non-volunteers. They were also

more often less depressed or fearful. A study by the American School of Public Health at the University of California even showed that intensive volunteer work has a bigger influence on a lower death rate than exercising 4 times a week. In any case, you help others with volunteer work while exercise only benefits you. The choice is yours.





## More time

**A**part from a good feeling, helping others also gives you more time. Marketing professor Cassie Mogilner of the University of Pennsylvania (USA) found this out. She conducted various experiments in which a group of test persons were told to spend time with someone else. For example, they had to write a letter to a sick child or help a student with a project. The control group were allowed to do whatever they wanted in their free time or were given a meaningless task, such as counting the number of times the letter 'e' appeared in a text. After this, Mogilner looked at the influence that the tasks had in relation to perception of time. The test persons who had 'given away' up to half an hour in all experiments to helping others believed that they had had more time to themselves. Mogilner thinks that the feeling of ability that you derive plays a role here. You feel better about yourself and you do not see that time as lost. Hence, you probably think you can do more. She advises people who never get anything done to devote their precious time to assisting others.

## Tip 2. Show someone the way

**The deed** From research it appears that nice people are happier, healthier and more attractive.

**The yield** Let's start with the latter. According to anthropologist and relationship expert Helen Fisher from Rutgers University (USA), more than 80% of females look at physical appearance and good financial standing when it comes to choosing a partner. So, having that six-pack and driving a fancy car does hold a man in good stead among

the ladies. Also, being nice keeps the fire going in the long run in the case of both sexes. This in itself is already a good reason to always be nice, just in case you run into your future partner. But there is more. Test persons at the University of London (UK) were asked to do something nice for 10 days. Another control group was asked to do the opposite. All the nice actions such as holding the door open for someone, helping a stranger find his way or helping a blind person

cross the road, seemed to have a positive effect on the test person's mood. Being nice is also good for your health, according to British chemist and science journalist David Hamilton. When you help somebody, the hormone oxytocin is released. This stimulates the production of nitric oxide in your blood, which expands your blood vessels and lowers your blood pressure. And this is good for your heart. So a little trouble ultimately means good health.



## Research shows: those who give money away feel better and richer

### Tip 3. Give generously

**The deed** It's quite something to give away your hard-earned money to somebody else as if it grows on trees. Still, research shows that a fat bank account does not contribute to a large feeling of wellbeing. Better still, it's sharing money that makes you happy.

**The yield** In 2013, psychologist Elizabeth Dunn of the University of British Columbia (Canada) conducted research about how people spend their income and how happy they are. Her results showed that people who give to charity are happier than those who spend their money on a new television set or the latest fashion. Economists at the universities of Rome and Milan (Italy) tested this again in 2014. They had test persons play a so-called 'investment game'. Here a player sends money to another player without knowing if and how much he will get in return. Even when the generous were not or hardly rewarded for their generosity, they still felt happier than the stingy people. Giving money away delivers a feeling of wealth, funnily enough. Researchers at Yale University and Harvard Business School (USA) asked a group of test persons who donated to others and test persons who didn't make donations about how happy they were about their financial situation. Time and again the givers seemed to feel richer than the non-givers, apart from whether they had money in the bank or not. So giving is rewarding, even though you can't express the yield in a percentage or an amount.



### Tip 4. Be happy with what you have

**The deed** Do you go green with envy when you see your neighbour's brand new BMW parked in his driveway? Do you go crazy with jealousy when your colleague easily brings in tons of clients while you have hardly managed to convince just one? It's best you stop being envious this very instant. As British philosopher Bertrand Russell (1872-1970) said: "If I can cure myself of envy, I can be happy so that others will envy me."

**The yield** Andrew Clark of the Paris School of Economics (France) wanted to know how your happiness is influenced

by the people around you. He realised when everybody in a company is given a raise, it doesn't make anyone really happy. However, if it is only your colleague who is given an increase, chances are that this will make you very grumpy. Clark says this is due to the fact that we constantly compare ourselves with others and that we can only feel happy about something if this is in relation to what they have. However, you can feel better by looking at people who have less than you. It is sensible not to compare yourself with

smarter, more attractive, better, richer or funnier people. This will ruin your mood. Also avoid being envious of people similar to yourself, such as your colleagues, neighbours or roommates. Instead be happy with what you have. Research by psychologists of the universities of California, Davis and Miami (USA) showed unequivocally that this will truly make you happy. Test persons who wrote down for a week what they were grateful for in their lives were a lot happier than those who recorded the problems or irritations they had.





## Natural talent

**W**e actually don't need all this advice to become more generous people. We are all natural Mother Teresas. We might have forgotten about showing compassion and helping others, but we all have this human calling in us. This became apparent from a study by the Max Planck Institute. Researchers looked at what 18-month-old children did when a grown-up tried to open a cupboard while their hands were full, or when a book fell from a large pile in their hands. The little ones immediately came to their aid, without the adults asking for it, without being unhappy about it and also without any reward. Chimpanzees also display this behaviour, only to a lesser degree. The motivation to help one another is a typical human characteristic, according to researcher Felix Warneken.

## No happiness without others

**Y**ou could have a million rand in your account, have the coolest job in the whole world, be the most attractive person in the universe, but it is worthless if you can't share it with anybody. In *The World Book of Happiness*, you can find the wisdom of 100 happiness professors gathered from all over the world. Almost all of them emphasise that it is friends, family, children or a partner who makes us feel really happy. So investing time in others, even if you just drink a beer with them, is never a waste of time. Even if it does not make them happy, it will certainly make you happier.

## Tip 5. Paint a wall

**The deed** Of course, you are not always jumping for joy at the thought of helping your friend move or helping to paint your parents' house. Surely you can use the time to do other stuff, right?

**The yield** Neuroscientists at Emory University (USA) did an fMRI (to measure brain activity by detecting associated changes in blood flow) of test persons who were faced with the 'prisoner's dilemma'. In this game, 2 players are presented with a situation in which they face a choice: work

together and both benefit or don't work together and thus ensure your own wellbeing. The players do not know the other person's choice and thus they decide independently from each other if they will help the other. From scans of those who decided to work together it became apparent that the brain areas that were stimulated are the same ones that are activated when people are rewarded or enjoy something. The researchers concluded that helping others ensures the

same effect as helping yourself. Allan Luks, head of various non-profit organisations, did a study among 3,000 volunteers. The American described a feeling called 'helper's high'. This is the phenomenon where people experience a pleasant physical sensation when they help others. Many say they get a kick from it, feel stronger and derive energy from it. Helping others has another personal advantage: you forget your own problems. And this will curb depression and dejection.



Age-old mammoth teeth are worth a pretty penny

# The battle for a tusk

*Once, people killed mammoths for their meat. Today, the residents of northern Siberia search for the extinct animal's valuable tusks. Photographer Evgenia Arbugaeva recorded this activity, which is a nightmare for many palaeontologists.*

■ TEXT: MARC KOENEN / PHOTOGRAPHY: EVGENIA ARBUGAEVA







### Take a stab

Slava Dolbaev picks out 2 tusks from the eroding coast of Great Lyakhovsky, an island in the East Siberian Sea. The soil, which was permanently frozen before, thaws slowly, making mammoth remains accessible. It can still take days for Dolbaev to excavate both teeth.





## Rounding up the posse▲

Great Lyakhovsky is not the only place where tusk hunters work. In spring and summer hundreds of them walk along 1,000km of coastline, searching for the ivory that they live off.

## Broken bone ►

Why did the mammoth become extinct 10,000 years ago? You have to study the soil and bones to determine this. But there is no yield for the hunters here. So they break the skull to see if there is a tusk underneath.







#### ◀ What a mess

You can't be too preoccupied with your own hygiene. Spring and summer are short here. You have to gather a large part of your annual income in about 4 months. Washing and drying clothes will take too long.

#### ▼ Illegal

You are only allowed to search for tusks with a permit. Milyutin (pictured) does not have one. That is why he puts his treasure in a camouflaged hut. Russian custom officials will not see him when they fly over with their helicopters.





### Diet plan ▶

You should do this work if you want to lose weight. By the time the hunting season is finished, food is also depleted and the men lose up to 10kg.

### Just a youngster ▼

The hunters found Yuka in 2010 near Yukagir, one of the few villages in the area. It was a very well-preserved young mammoth fossil believed to be 6 to 11 years old when it died. It is not known how much was paid for it.







#### ▲ Pay day

At the end of summer the men and their cache travel to the city of Kazachye, some 200km further away. Depending on the quality of the ivory, they will get between 50 and 250 US dollars per pound.

#### ◀ The end

This is how mammoth tusks end up. In China, ivory cutters spend up to 5 years cutting a single tusk. It is said that up to a million dollars is paid for the end result.



# Nuisance inventions

*What do the wheel clamp, asbestos and a leaf blower have in common? They are ranked among the most impractical and downright dumb inventions of all time. Braintainment presents, in no particular order, 7 inventions that have us believing that their creators were definitely smoking their socks.*

■ TEXT: TONIE MUDDÉ

**W**hat is the worst invention ever? The atom bomb is regularly mentioned. By the same token, we could also argue that its inventors succeeded in making a powerful weapon. In putting together this list, we needed to

clearly define what constitutes a terrible invention. As such, we came up with the following criteria:

■ The invention is a tangible and/or technical product. So concepts like the African Union or shopping on Sundays are disregarded.

■ The invention failed. Also allowed are inventions that are still available but cause a lot of irritation.

■ The invention was not meant to make people ill or kill them. Otherwise, we would have an entire list of weaponry.

## 1 Wheel clamp

**A**merican Frank Marugg is probably one of the least loved inventors of all time. Politicians who were friends with the creative inventor pointed towards the growing parking problems in the town of Denver, Colorado. Marugg came up with a solution and became the proud owner of the

patent for the wheel clamp in 1958. Today, the device is used all over the world. The municipalities obviously thought this to be a useful deterrent against illegal parking. Still, the popularity of the wheel clamp is quickly diminishing. Amsterdam stopped all use of the wheel clamp in 2008. An anti-wheel

clamp law was adopted in Great Britain in 2010. And rightfully so, because the idea behind Marugg's invention is rather peculiar. If you are not allowed to park your car somewhere, then it obviously causes a nuisance. So why would you clamp it down on that spot? It just doesn't make sense.



**How innovative: a wheel clamp with sharp points to puncture your tyres.**

## 2 Neck tie

**A**ccording to some people, the neck tie was probably invented by a sadist or masochist or an unhappily married woman. But while it is unclear who invented the tie, it is certain that it is not on everyone's list of favourites. Prince

Claus of the Netherlands is one such person. During a ceremony at the end of 1998, he said: "Tie wearers in all countries, unite, cast off the rope that hinders you." Prominent people in the crowd followed his example. The popularity

of the tie has diminished since then. *Braintainment* would like to help a little as well towards the demise of the tie. For example, by pointing out that the tie can cause eye problems. When worn too tightly, it can increase pressure on

the eye socket. Researchers of Cornell University (USA) discovered in 2010 that test persons had worse vision because of this. Such a tight 'noose' could even cause eye nerves to gradually die. Without treatment, this could lead to blindness.

**Did you know that there are 85 different ways to knot a tie?**



### 3 Snooze button

**H**ow popular is that button that gives you a few extra minutes of sleep in the morning? It certainly didn't impress American student Gauri Nanda, who struggled with the snooze button every day. Sometimes she rammed the button for 2 hours before

waking up. That is why she made Clocky, an alarm clock that forces you to get out of bed. How? Clocky looks like a small version of the robot R2D2 from *Star Wars*. The loud beeping noise certainly wakes you up. And snoozing is no option because you have to make an

effort to switch Clocky off. It has wheels. As soon as Clocky goes off, it rolls off your nightstand and can wander about aimlessly in your bedroom. There is only 1 way to make it stop. Get out of bed and switch it off. That should wake you up.



Need more of a challenge when waking up? Buy a Clocky, the alarm clock on wheels.



First check if it is asbestos, then get rid of it.

### 4 Asbestos

**E**mperor Charlemagne (747-814) had a neat trick to entertain his guests. After dinner he would yank the tablecloth off the table and throw it into the fire. The guests were amazed because the cloth didn't catch fire. It was made from asbestos. Asbestos consists of minerals and tiny fibres. It is cheap to mine and is fireproof. So, it makes sense that it has been used for centuries for all sorts of applications. The dangers of its use only became known in 1931. Health researchers found that the sharp fibres can infect the lungs. How? They diminish the elasticity of the lungs, making it difficult to breathe. It later became apparent that asbestos could also cause lung cancer. Asbestos is, for the most part, no longer in use. Over the years this substance has been used in 3,500 various products varying from brake pads to carpets and drainage pipes to flower pots.



## 5 Leaf blower

**I**t's loud and quite frankly a waste of energy. Most people will agree with that (including the ed). Lots of people get irritated with these devices. Think about your quiet Sunday and your neighbour decides to tidy up his garden. The noise can be very annoying. In fact, did you know that most garden appliances produce more noise than a motorcycle? All of this while the solution is so simple. Exit the leaf blower and enter the silent rake.

## This garden appliance makes more noise than a motorcycle

Apart from leaf blowers there are also leaf suckers. They shred the leaves and catch them in a bag.



It seems a good idea to collect old plastic bags. These bags will be recycled.

## 7 Plastic bags

**T**he plastic bag is an invention that plays into one of the worst properties of man: laziness. After all, anyone can take their own bags or backpack to the shops. Plastic bags have a massive negative effect on the environment. Oil is needed for most plastics and trucks are needed to collect recycled samples. And the damage is even greater when they end up in the open. Researchers from Nihon University in Japan studied how the 'white mass' perishes in the ocean. It seems it is a myth that plastic stays intact for hundreds of years. The substance

begins to disintegrate after a year because of exposure to sun and water. Small poisonous particles are released with this process, which seriously disturb the reproductive hormones of some animal species.

## 6 Clippy

**I**magine the scene: you are concentrating deeply on your work and suddenly a paperclip appears on your computer screen. The thing is impossible to ignore. It moves, rolls its eyes and starts to talk. "It looks like you are writing a letter. Would you like some help?" The talking paperclip probably means well, but can be

annoying. Sometimes this frustration makes computer users creative. For example, they created little clips about the creature. Have a look at [tinyurl.com/a8vq05](http://tinyurl.com/a8vq05) and see how Microsoft founder Bill Gates runs from his own creation. The billionaire stands at the edge of a cliff while writing his suicide note. Even there Clippy manages

to find him. "It looks like you're writing a suicide note. Would you like some help?" Microsoft has since banned Clippy from all software. But the virtual jammer will still offer its services via the older version of Office for many years to come.



[braintainment@panorama.co.za](mailto:braintainment@panorama.co.za)



**EXTRA INFO**

[tinyurl.com/3yydgg6](http://tinyurl.com/3yydgg6): senseless Japanese inventions.





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## Incognito

**H**arry Houdini was a great escapist. Dynamo is a great illusionist but Liu Bolin must be the ultimate master of disguise. Hailing from China, Bolin uses camouflage to blend in perfectly with his surroundings. It takes up to 10 hours and two assistants to apply the make-up needed to perform his disappearing act. Can you spot him in this picture?



## Why the people cannot rule themselves

*Democracy is the best way to govern the people, right? Well, not necessarily. It would seem that the advantages of democracy are often over-estimated. Here are 8 examples of why letting the masses decide is not always a good thing.*

■ TEXT: ANOUSCHKA BUSCH



Death to  
democracy?



## 1. Not words, but deeds

**T**here is constant fighting in a democracy. One faction makes the law while the other breaks it. Decisions are reversed as soon as a pressure group lobbies hard enough. There are compromises all the time. There is none of that with an authoritarian regime. This makes such a regime more flexible and powerful. New laws can be enforced straight away. There are no endless discussions about pros and cons of new legislation. Changing situations can be reacted to at once.

An authoritarian regime is often more successful for countries that experience big change. Singapore is an excellent example. Officially a parliamentary democracy, but in practice the People Action Party (PAP) has been pulling the strings since 1959. Opposition is kept quiet as much as possible. This

firm guidance ensured that Singapore could climb up from a third-world country to one of the richest nations in the world after British colonisation. One in 6 residents is a millionaire in that country. Compare that with Nigeria which became a democracy. This country is also a former British colony and has, contrary to Singapore, enormous oil reserves. Still, 70% of the population lives under the poverty line. Where does the money go? Partly to the pockets of the democratic leaders. The average Nigerian senator earns more than the president of the USA, and the country has 109 of them. In Singapore the money of the economic growth was used to build financial reserves and to improve the living conditions of the residents by investing in housing and education.



Developing countries are sometimes better off without a democracy.



Things are fine in Qatar, as you can see. They don't need a democracy there.

## 2. Democracy hinders economic growth

**O**ne of the ideals of democracy is to promote financial growth. However, many democratic countries become rich, but not because they are democratic. The connection seems obvious, because in the past many non-democratic countries were under communist rule. Hence, a free economy did not exist. And it is that free economy that creates wealth. However, it is actually the non-democratic economies that have grown enormously in the last decennia.

The 2 countries that have the largest growth in gross domestic product per capita, according to the World Bank, are Azerbaijan and China between 2006 and 2012 – neither are democratic states. Autocratic regimes also don't fare too badly as far as wealth is concerned. Of the 25 countries with the highest gross domestic product per capita according to the International Monetary Fund, 5 of them are under singular rule: Qatar (number 3), Singapore (8), Kuwait (17), United Arab Emirates (19) and Brunei (22).

## 3. No vision for the future

**D**emocracy makes for short-term thinking. Why? Politicians are more interested in grappling for power than carrying out their mandate. Also, voters think mainly about their own interests. This is known as the 'tragedy of the commons': if everybody acts in their own interest, everybody will go backwards in the long run. The word 'common' refers to a

communal piece of farmland. Every farmer has an interest to put as many cows as possible on that land. But when every farmer does that the land will be overgrazed and eventually nobody benefits. On the other hand, look at the example of a group of friends going out for dinner and sharing the costs. The bill always ends up higher than if we would all pay for ourselves.



# Sadly, voters know far too little to vote sensibly

## 4. Voters are not in the know

**W**hy do we need a driver's licence to drive, yet everybody can vote regardless of what they know about politics, the constitution or economics? Apart from the leading party and a few opposition parties, many voters don't even know who is in government, it seems from various studies.

How many people know all the parties and what they stand for? But don't worry; you don't have to feel too guilty about your ignorance. According to economists, it is best not to get too involved in politics as a voter. Seeing that your one vote will only make a marginal difference, it is not

very economical to invest a lot of energy in gathering information. The only problem is that if you as voter know nothing about politics, then how can we put an end to poor governance with our vote? After all, isn't that one of the big advantages of a democracy versus a dictatorship?

## 5. Any Joe Blog can become a politician

**V**oters don't have to know or be able to do anything in a democratic system. But more worrying is the fact that this also goes for those who want to be elected. All that is needed is enough power of persuasion to ensure that you make it onto a party's candidate list during elections. You don't need a university qualification or have to undergo an aptitude test to become a politician (just look at JuJu). A certain intelligence and managerial experience might be more important for the prime

minister, but a minister of defence may not necessarily have served in the army. No explanation is made to the voter as to the reason behind appointing ministers. In business you also don't have a say in who becomes your boss. But you can at least imagine that he was appointed on the basis of proven competence and not because of shady deals.

## 6. Voters are superficial

**A**re voters rational decision makers who determine their choice by careful consideration of the various standpoints of the parties? Not always. They would sooner vote for a cool and handsome head of a political party than one who is actually keen to fight for a good cause. For example, the American elections are in up to 90% of cases won by the candidate who poured the most money into a campaign.

But the first impression of somebody seems to be the most important factor. In 2014, research undertaken by Princeton University showed how the competency of a politician is estimated by his facial characteristics. And this indicated that the first impressions are deciding. Because the competence judgements that are given on the basis of someone's face seem to be a reliable prediction of how the elections pan out eventually.



Democracy has many disadvantages. But it is still the least bad system that we know.







RIES VAN WENDEL DE JOODE/H/H

## 7. Democracy has no meaning

**A**ccording to the ideal, democracy ensures that the will of the people is carried out. The reality is different. Let's take the Gauteng e-toll saga for instance. The vast majority of citizens opposed the introduction of the system. Yet, it still went ahead.

A part of the problem is that as a voter you vote for a number of standpoints of the party. Almost nobody will agree with all the points. So you will have to make do with the party that best represents your opinion. So a party with a few standpoints that nobody agrees with can still win. But maybe more importantly, you have no guarantee whatsoever that the party you vote for will deliver on its promises. After all, politicians can change their minds after the elections.



ED OUDENAARDEN/ANP

Increasing the maximum speed on the highway might make voters happy. Maybe they will vote for you next time.



AAU/HOLLANDSE HOOGTE

The goings-on at parliament are not dissimilar to those seen in a circus.

## 8. Masses have herd mentality

**W**hy would we bother with the opinion of the majority? Just because the majority think something doesn't make it true or right. History has taught us that. Most people used to think that the world was flat. We were also convinced that slavery was just and that corporal punishment was the only way to discipline a child. And we don't have to remind you that Adolf

Hitler came to power democratically. It is simple: if you want to know what the best treatment method is for a certain disease, then you don't ask the majority of South Africans what they think. No, you consult an expert. The average voter knows nothing about economy or foreign politics. So, why should a person in government listen to them?



Thirsty? It's best you reach for a glass of water rather than a beer

# Hydration station



Warm weather? Keep drinking. Excessive sweating means you run the risk of dehydration.

*Coffee dehydrates and a thirsty camel draws from its humps. Is this true? Here's everything you need to know about quenching your thirst.*

■ TEXT: CARIN RÖST

## Your body needs moisture

**Y**ou might not think so when you look in the mirror, but more than half of your body consists of water. The water exists in the cells, in the spaces in between and in your blood. What does all that moisture do? It aids in ensuring that nutrients are absorbed by the body. Furthermore, water also absorbs waste matter that can be transported through the body and eventually excreted. Your body also keeps your temperature in check through the formation of sweat. You

lose heat when this sweat evaporates. It is therefore imperative that your moisture levels stay at the right level. Men, whose bodies comprise 63% water, have to drink about 2.5ℓ of water per day. Women have more fatty tissue in their bodies so their bodies comprise 52% water. They can suffice with 2.3ℓ. Your hypothalamus will detect when you are dehydrating when you lose more than half a litre of moisture. The hypothalamus is a gland deep inside the brain. It signals

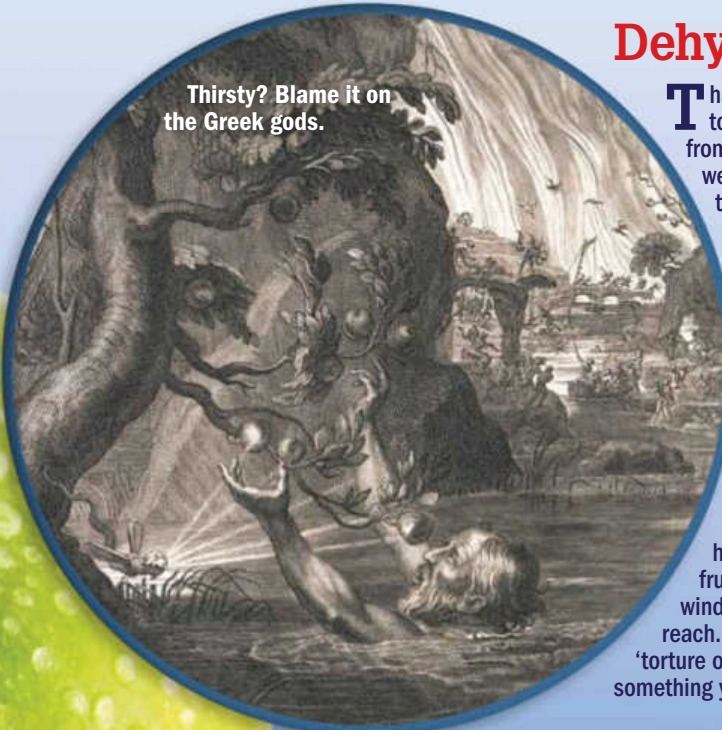
among other things that the blood is less hydrated and then delivers a feeling of thirst. Your body will give you a more severe signal if you don't drink at that moment. That's because when you lose more than 2% of body weight, you will get a headache and become listless. A moisture loss of between 3 and 5% will give you heart trouble. And if you lose more than 20% you will not be able to recover. But that only happens when you are without water for at least 3 days in a very dry area.

## Water with pieces of fruit

**T**he meaning of the saying 'An apple a day keeps the doctor away' has little to do with thirst. But there might be more to this saying. An apple is a good thirst quencher. It consists of 80 to 85% water. There are fruits that contain even more water. The watermelon is 97% water (hence the name).

The expression 'An apple a day keeps the doctor away' originated in 1866.

Thirsty? Blame it on the Greek gods.



## Dehydrated king

**T**hat thirst is mentioned as a serious torment becomes apparent from a story from Greek mythology. Tantalus, the wealthy king of Lydia, was a guest at the table of the god Zeus every day. The gods talked to one another at the table. But Tantalus was not honest with Zeus. He told the godly secrets to humans. He also stole nectar and other spices from the heavenly table and gave those to the people. To punish him, Zeus threw him in a pond where little waves lapped against his chin. But he couldn't drink from the pond. Every time he bent over to take a sip, the water would recede. Tantalus was also hungry. Every time he wanted to pick the fruit from the trees above him, a strong wind would blow the branches out of his reach. Hence today we have the expression 'torture of Tantalus', meaning yearning for something you really want but can never get.



## Dry poo

You will not find a camel in a panic when it can't find water. That seems logical because it has an enormous water supply in the humps on its back. This couldn't be further from the truth, because the humps don't contain water but fat – up to 40kg in total. A camel feeds off this fat reserve when there is no food available. Still, the 'ship of the desert' can do without water for a few weeks. How does it do that? Firstly, its body temperature fluctuates between 34 and 42°C. It starts sweating when its body temperature rises over 40°C. That saves a lot of moisture. Also, its kidneys derive a lot of water from its pre-urine. That is moisture with waste matter that is formed by the kidneys and what is eventually passed through as urine. Furthermore, a camel's excrement becomes dry when water is scarce. When a camel eventually finds water, it doesn't waste any time rehydrating itself. It can gulp down some 200ℓ in 3 minutes. This equates to a third of its weight.



## Plant tweets for water

"You didn't give me enough water" and "This is urgent, give me water!" These are just 2 examples of tweets by thirsty plants. In 2010, researchers from New York University invented the so-called Botanicalls Kit. It is a device that consists of a number of sensors. Simply place it in the soil and it measures the moisture content. It will send a tweet when the plant begins to dry out. If you think you get rid of it by watering it, then you are sadly mistaken. Because the plant will also let you know when it is drowning with the tweet: "You gave me too much water."

## More please!

Are you really thirsty? Some say you should definitely not drink coffee and tea. Because this would only further dehydrate you. But according to many health experts, this is a myth. You get just as much water with a cup of coffee or tea as with a glass of water. Caffeine does ensure that you excrete moisture faster. That is why you have to go to the loo more often after drinking a few cups of coffee.

On the other hand, alcoholic drinks do dehydrate you. Alcohol hinders the functionality of the

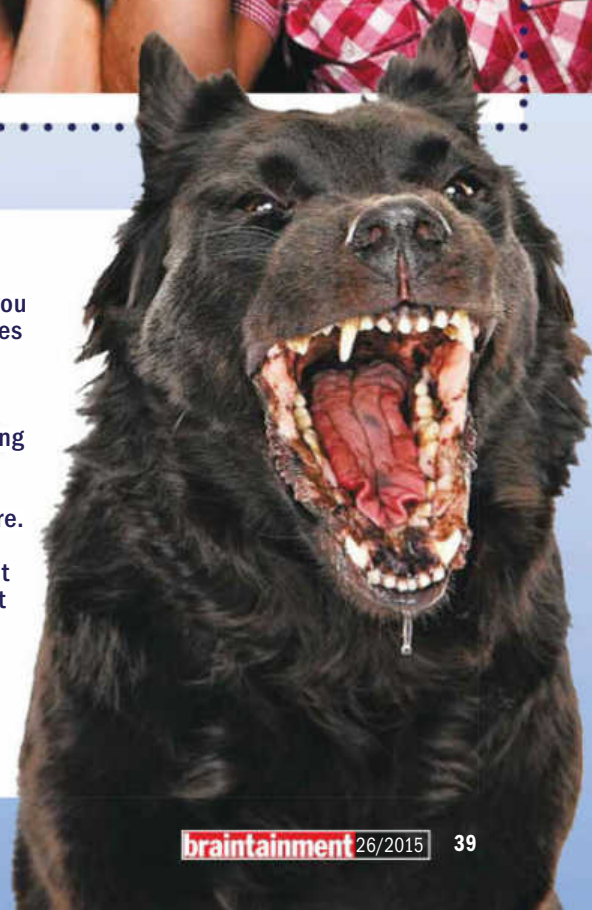
anti-diuretic hormone, which stimulates the absorption of moisture through the kidneys. So less water is absorbed when you drink alcohol. The result: your urine is more watery than normal. That is why you have to go to the loo all the time after a few beers, and why it also makes you thirstier. It also explains why your designated driver is fed up with the party and wants to leave. He has had enough soft drinks and juices and his kidneys are functioning just fine so he is no longer thirsty.



## Rabies thirst

You get infected with the rabies virus when you are bitten or scratched by a contagious animal. Some bats, foxes and other wild animals carry the virus in Europe. In South America, Asia and Africa there are many dogs infected with the virus. Such an infection is a nightmare, especially when you consider that you can't possibly drink despite the exasperating thirst. The virus moves fast and soon it enters your brain. Fever, nausea, headache, fatigue and confusion follow. You also

get thirsty. But when you try to drink, the muscles needed for swallowing and breathing cramp. These cramps are so unpleasant that drinking just becomes impossible, no matter how dehydrated you are. You could also die during such a cramp. It is therefore better that your suffering ends soon. Most patients die within 2 weeks after the first symptoms appear if they are not treated.





## How a spoilt prince became an example for millions

# Enlightened prince

*Long ago, in a land far from here, lived a rich prince. Siddhartha was intelligent, handsome, musical and an excellent warrior. He would have made a great king, which his father eagerly hoped he would be. Instead, he chose to become a monk – one who is revered by millions today.*

■ TEXT: CARLIJN SIMONS

**L**egend has it that a very pregnant Queen Mayadevi was travelling through the vast forest of Lumbini, just across from the border of what is present-day India and Nepal. She was accompanied by her sister, ladies-in-waiting and bodyguards. This was where the queen would deliver her baby, as tradition dictated. She was past 9 months, so the baby would arrive soon. Such a long pregnancy was regarded as a good sign and indicated the arrival of an unusual baby. This child was most welcome in any case. She and King Suddhodana had

already given up hope of a successor when Mayadevi dreamed about a white elephant that waved its trunk while trumpeting. She knew what that meant. She would bear a son, a son who



**A relic from 100BC that depicts the elephant dream of Queen Mayadevi.**

above all would be kind or a saint. That same night she became pregnant.

### ● Fact becomes fiction

Mayadevi delivered her son in the middle of the forest. The child would eventually

be known as the Buddha. To this day he is seen as a shining example of kindness and generosity by 350 million people across the globe. When was he born exactly? Nobody knows for sure. It could have been

## To forgo is nonsense

**S**ome clergymen committed self-flagellation in the search for salvation, and still do. The Buddha also tried to find salvation this way. He lived on berries and plant roots, hardly slept, didn't wash himself and retreated naked into a cave for months. Still the big miracle didn't come. Then, one day, he heard a little girl sing about a cither. "When the strings are strung too tight they will break. When they are too loose, the sound will be too dull. Only when the strings are just right, will the music come

out." And then the Buddha understood. Such an extreme, sober lifestyle would not necessarily lead to salvation. And also, what is the point of finding salvation if it means you will die of hunger, thirst and exhaustion? That couldn't be the meaning of life, he thought. You must safeguard yourself against extremes. You do not have to give in to every sensory desire, but to deny yourself everything is also not necessary. Buddha started eating, drinking and sleeping from that moment on.





## Godly test

**A** Buddha is easy to recognise according to the old writings. He has a number of physical traits that reveal his special designation. These traits are still used by the Tibetan high priests to find the next Dalai Lama. Do you think you could be next? Check yourself:

■ Hands with which you can touch your knees without bending your back.

■ The presence of 40 pearly white teeth instead of the usual 32.

■ The roundness of a nearby fig tree.

■ A white anastomosis. This is a little bundle of arteries on your forehead.

■ A growth on your crown (top of your head).

■ One hair per follicle.

When you have completed this test successfully you can report yourself to the priests.

1800BC or possibly around 563BC, according to historians. However, on the basis of archaeological findings and knowledge about the origin of old texts, it is more likely that he was born around 400BC. There are only a handful of old texts that allow historians to reconstruct the life of the Buddha, which creates this uncertainty.

These texts are complicated writings in Sanskrit or epic poems in a forgotten local language where the hard facts are not as important as the philosophical message. Also, his followers only began writing down his work hundreds of years after his death.

You could even wonder if the Buddha really existed. There aren't any remains or fossilised footprints, ▶



# It is not important for the true followers whether Prince Siddhartha, aka the Buddha, really existed

► contrary to the dinosaurs, where proof of existence can be found. He also did not take the trouble to write anything down. As such, fact and fiction have become intertwined. Historians seriously doubt if the Buddha really possessed mythical or miraculous powers, which are attributed to him in some texts. Still, most of them agree that the story of his life has to be based on truth. Who was this Buddha and what made him so famous?

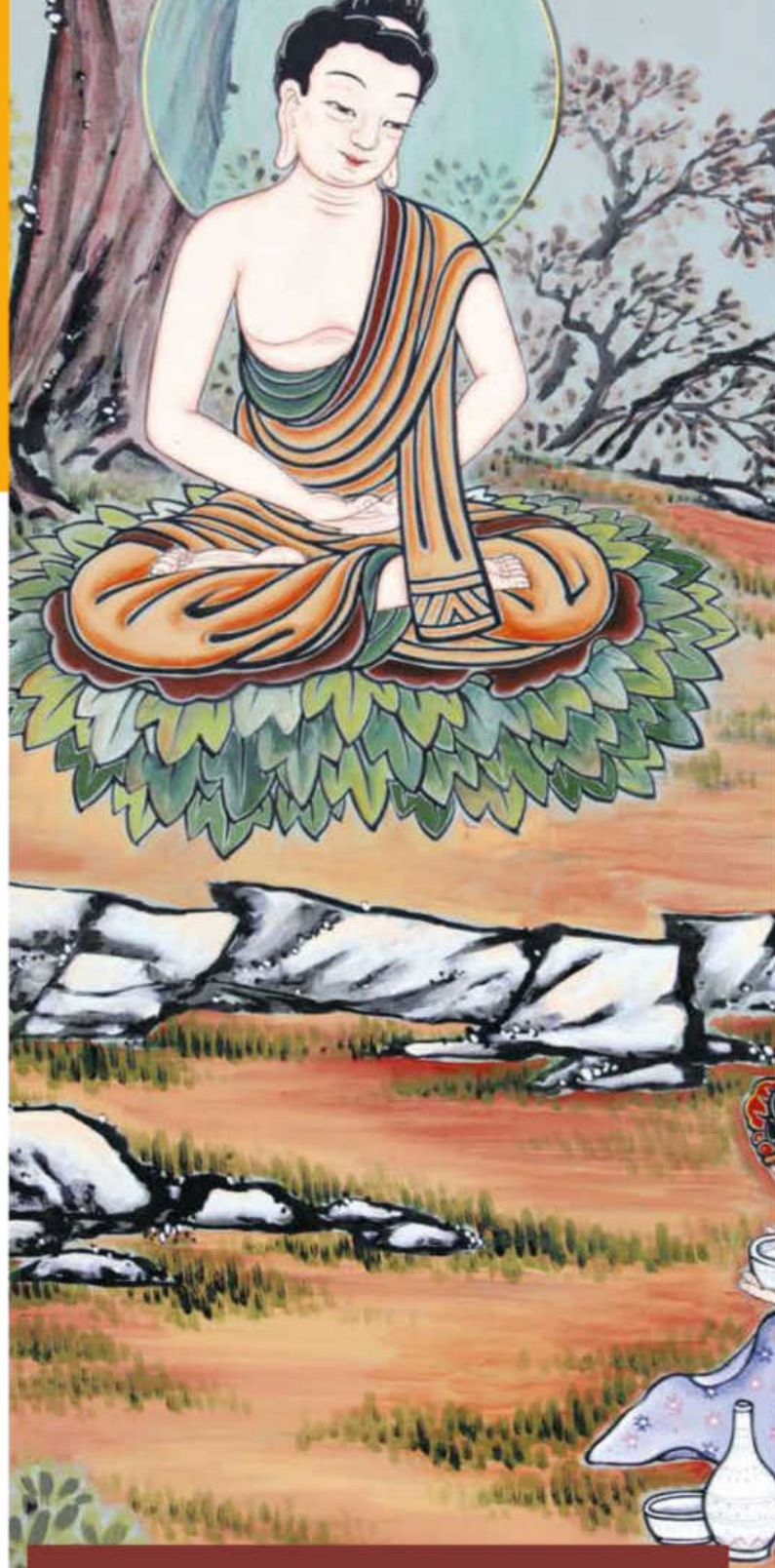
## ● Misery opens eyes

His proud parents called him Siddhartha, meaning 'he who will fulfil his goal and have prosperity'. However, would he fulfil his destiny as king or as saint? His father did not forget the dream of the trumpeting elephant and wanted to prevent Siddhartha from becoming a monk. He forbade his son from going outside so that 'ordinary' life would not lead him into temptation. He also made sure that the prince was granted his every wish in the palace. There were acrobats, musicians and storytellers to entertain him, lavish parties with food, drinks, dancing and girls. Siddhartha married a beautiful bride at the age of 16, in accordance with the royal plan that Sudhodana had devised. But the prince was curious. He managed to escape the palace gates, without the king's knowledge, to see what the world outside looked like. On one of his journeys of discovery he

met an old, weak man, who was not capable of looking after himself. On another trip he encountered a young, sick man who was more dead than alive. He also witnessed a funeral procession. Siddhartha had never seen such misery in his life. He soon began to think that nobody could escape illness, old age and death. He then wrestled with the thought of the true meaning of life. He was intrigued by the question and decided to find the answer. One day he met a monk on one of his wanderings. He soon realised that life as a monk, stripped from his material possessions and worldly responsibilities, was his only chance to find the answer to his question.

## ● Desire is suffering

At age 29, Siddhartha left the palace without telling anybody. He shaved off his hair at the edge of the forest, took off his royal clothes and removed his jewels. From now on he would be known as the monk Gautama, his family name. He travelled the entire country by foot, searching for a master who could help him. One taught him how to control his thoughts. Another showed him how to walk on burning coals. But they didn't have an answer to his question. "I will have to try and find it myself if nobody can help me," thought Gautama. He found a fig tree in a deserted area along a river near the city of Gaya. This became his home base. He could beg for food during



## No ordinary saint

A strict caste system was in force in India at the time of the Buddha. The Buddha himself was part of the next-to-highest warrior caste. However, the Buddha didn't see himself as some sort of godlike being, just as he also didn't consider his doctrine a religion. He saw himself as someone who had been enlightened, nothing more and nothing less. He allowed everybody in, no

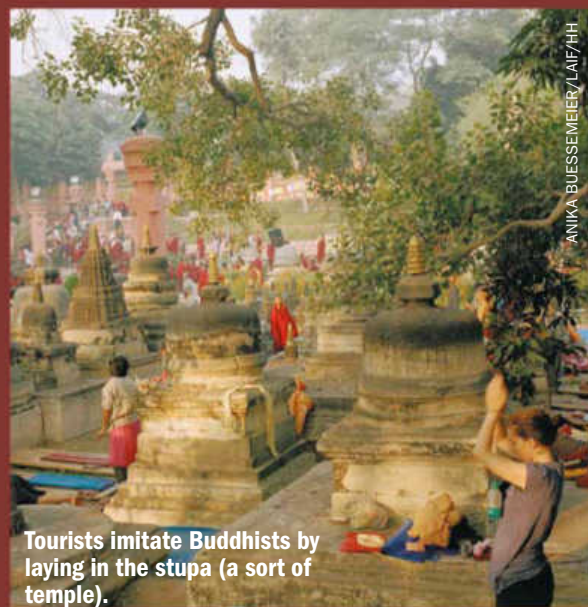
matter what their social standing. This included kings, criminals and farmers. They were all welcome, as long as they promised loyalty to him, the word and the order. Women were also allowed to join his movement. He didn't expect every follower to become a monk and leave his worldly life behind. A society also needs people who work and start families, he thought.



A young woman brought him a bowl with milk when he was down and this helped him regain his strength.

## Millions of devoted followers

After his death, the Buddha's teachings slowly spread over the rest of Asia and to Japan, Sri Lanka, China, Thailand and Tibet. Buddhism found its way to Europe and America at the end of the 19th century and there are now 350 million Buddhists worldwide. Various countries have developed their own version of the Buddha doctrine, with their own traditions and rituals. However, it is not a religion where one certain god is adored. Instead, Buddhism is still experienced as a spiritual tradition. Buddhists don't have to come to the temple every week and there are also no complicated accession rituals. They only have to promise to study the doctrines of Buddhism, but they can remain Jewish, Muslim or Christian. Followers of Buddha try to find salvation like him by meditating often and being conscious of life.



Tourists imitate Buddhists by laying in the stupa (a sort of temple).

ANIKA BUESSEMEYER/LAIF/HH

remove such thoughts from his head.

### ● Buddha sees the light

Not long after this, on one of the nights under the fig tree, it all became crystal clear. Gautama suddenly understood why people suffer, that they could end the suffering and how they could do it. He said that one should not get attached to worldly things and loved ones and should not devote time to such wishes. At last, he had found an answer to his question. This was the enlightenment that he had searched for. The enlightened monk Gautama, now 35 years old, could call himself a Buddha: 'he who has awoken'. He understood that his task was to share his thoughts with others. He travelled the rest of his life with nothing more than his monk's habit and a begging cup. During his travels he spread the Dharma, his doctrine about human suffering. His followers soon grew to a group of some tens of thousands. Men, women, young, old, rich and poor all joined the Buddhist order in the hope of ending their suffering. The Buddha was 80 years old when he was invited by a blacksmith for a meal. Too old and weak, he did

not recover from the food poisoning he incurred. He slipped away in the comfort of his close disciples. "Work hard at your own salvation," are the last words that he mumbled. Then the earth started to shake and all the trees and flowers blossomed. They knew that

Buddha had started his last journey. ■

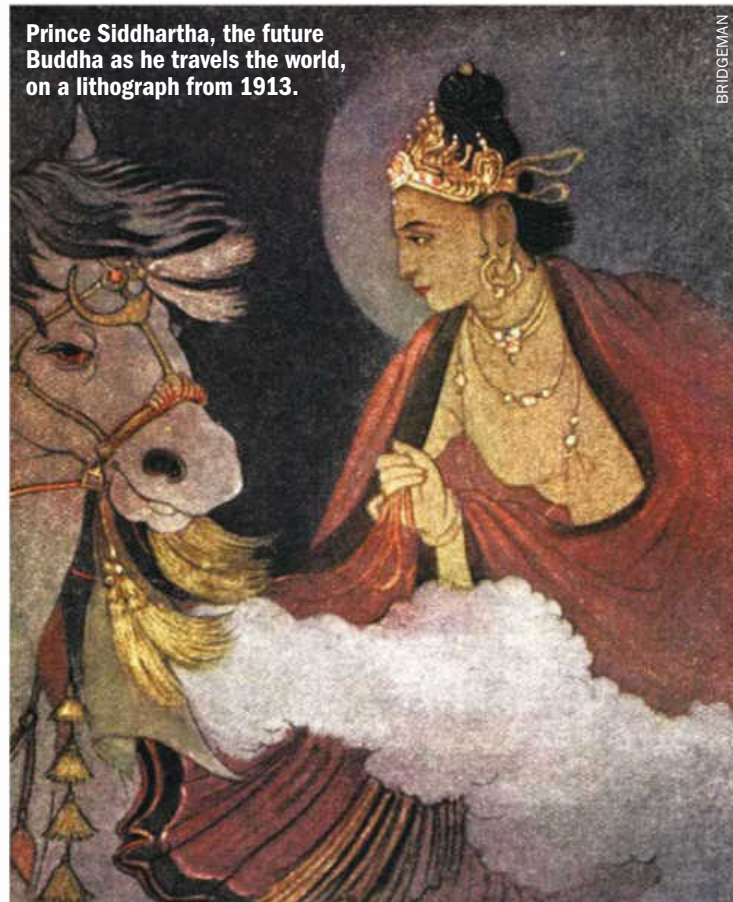
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### EXTRA INFO

*The Buddha: A Very Short Introduction* by Michael Carrithers. Anthropologist Carrithers studied old texts to create a biography of the Buddha.

Prince Siddhartha, the future Buddha as he travels the world, on a lithograph from 1913.



BRIDGEMAN

the day in Gaya and then retreat under the tree and meditate. He used all the hours between sunset and sunrise to examine deeply what he thought and felt. Then he had a thought of the desire to be with his wife and son and to stay forever young and be immortal. He soon realised that these types of thoughts were bad and focused on meditating to



## How do you make convincing imitation chicken using soy and water?

# Tastes like chicken?

*Imagine eating imitation meat that gives the most convincing carnivore a mouthwatering experience. Is that possible? Anouschka Busch searches for the ultimate meat substitute.*

■ TEXT: ANOUSHKA BUSCH


**R**ecently, I invited a good friend over for dinner. I served Chinese chicken and broccoli. After 30 minutes the plates were empty. “You didn’t taste anything strange about the chicken?” I asked. “No, it was very good,” she replied. “It was fake chicken, soy imitation,” I told her. “Seriously? You said it was chicken.” She was not very impressed when I revealed the news to her, but it was done in the name of science. The proof had been delivered. The praising stories on the internet and in newspapers are not exaggerated: the

pieces of chicken from the vegetarian butcher down the road really resemble chicken. Of course, when you really pay attention you will taste the difference. But prepared with a spicy sauce and a beer and some distraction in the form of a lively conversation and you can easily fool the most convinced meat eater. My friend does not have to be ashamed though. Even Spanish chef Ferran Adria (considered one of the best in the world) was fooled by this chicken when I asked him for his opinion. He could not believe that the chicken sosaties that I had prepared were not real chicken.

### ● Half-ready fake meat

The big question is: how do you make a product that really resembles meat from nothing more than some soy powder and water? The answer to that can be found from Ojah, a Dutch company that makes artificial meat. It made a vegetable product from gluten-free soybean meal, which can hardly be distinguished from real meat. This half product, as it is known, goes to other food producers that will add taste and turn it into their own consumer product. It has remained a secret how Ojah manages to produce fake meat from soybean meal. But the company is willing to reveal a little bit to me.





The structure and texture is the secret of (imitation) meat.

### ● Chicken taste comes from beer

To understand what makes making imitation meat difficult, we have to first see what makes consuming meat attractive to us. Scientists name 4 components: aroma, umami (the 'savory' flavour that can also be found in cheese and tomatoes), fat and structure.

These 4 components are vital in the creation of imitation meat. First, the meat aromas and umami are added by the producer and this does something to the soybean meal concoction. With chicken that would be the task of The Vegetarian Butcher, the company that has

created the imitation poultry meat. What exactly they do to create the meat taste is a secret. Joeri Hollink, product developer of Ojah, explains how you can create the aroma of meat using plant resources. "The chicken taste comes from yeast extracts, the by-product of beer. The taste of chicken actually does not exist. What you taste is about 300 to 400 various tastes, or in other words, fragrances. The aroma of chicken is made by isolating all these various fragrances from the yeast and then combining them to the right palate. Also umami, the savory taste, comes from the same yeast."

## Real men eat meat

Researchers from the University of Pennsylvania (USA) wondered why more women than men are vegetarians. They concluded that eating meat, particularly red meat, is associated with manhood in most cultures. In conversations about meat more 'manly' words are used. After conducting a survey, the researchers deduced that people judge men who eat meat as more manly than their vegetarian peers. In other words: eat meat if you want to be macho.



# Imitation chicken, pork and tuna work fine, but a steak is out of reach for now

## ► ● Fat is needed

The third important taste maker of meat is fat, but you won't find it in this vegetarian chicken. Still, fat is very important for the end result. When you fry real chicken in fat it loses some of its own fat. The vegetarian pieces of chicken suck it up. The result: precisely what we like about meat. Imitation chicken only tastes convincing after grilling or frying. But it is mainly the last component, the structure, which makes this product such a good meat imitation. It has the real structure, texture and 'bite' of

chicken. It is this factor that other producers of meat replacers still struggle with. Why is it so difficult to imitate the meat? Both soy and animal muscle tissue consist of protein. The protein of soy resembles a structure very much like meat protein. The difference is mainly how the protein is structured. Meat consists of small muscle fibres which come together in bundles. The plant-like soy protein used for meat replacement products are enormous shapeless masses. The key is to restructure the soy protein in such a way that it resembles meat.

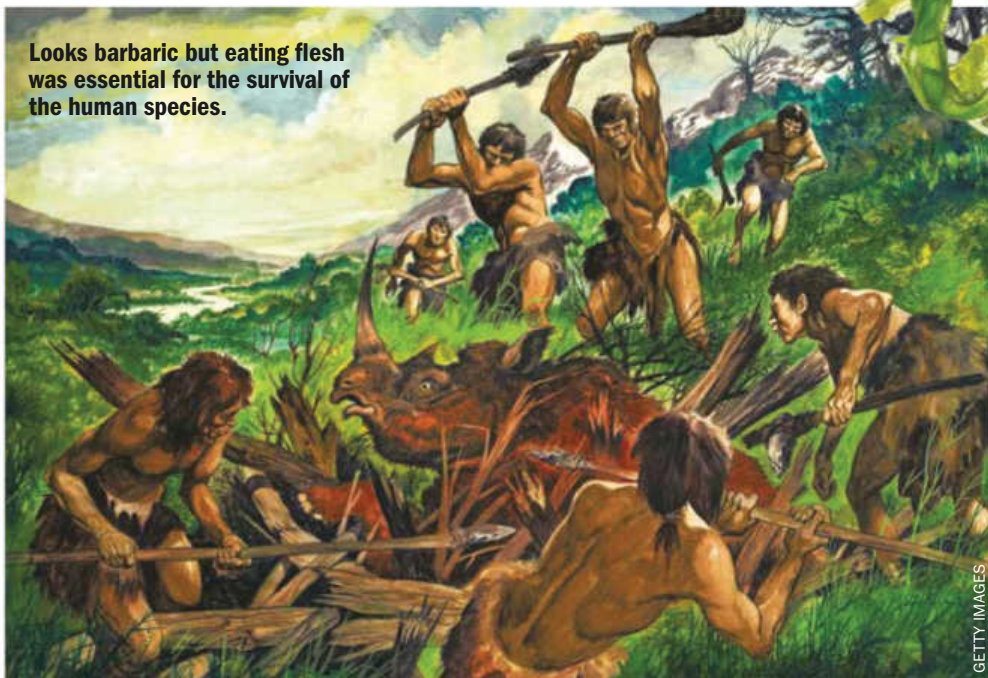
## ● Italian influence

So how did Ojah manage that? For starters, the company uses a large machine called an extruder. It can be used for a variety of things, for example to make spaghetti. In essence, it is a turning spiral in a tube. Soy powder is first mixed with water. The soy-water mixture is pushed through the tube at a high pressure. It is a bit like emptying a toothpaste tube. Thanks to the combination of temperature and pressure a very special protein structure arises that forms into a fibre-like

## Eating meat is in our genes

**W**hy are we so crazy about meat? This is partly because of tradition. Centuries ago, eating meat on a daily basis was only for people with enough money. The ordinary man on the street saw meat as a treat for special occasions. We still associate meat with luxury and festivities. But our need for meat goes deeper than that – it's in our genes. The fat in meat was a source of energy in prehistoric days. Meat also contains all sorts of good building substances. So it's logical that we are fond of it.

Looks barbaric but eating flesh was essential for the survival of the human species.



Soy is mainly grown in South East Asia and North and South America.

MICHAEL ROSENFELD/GETTY IMAGES



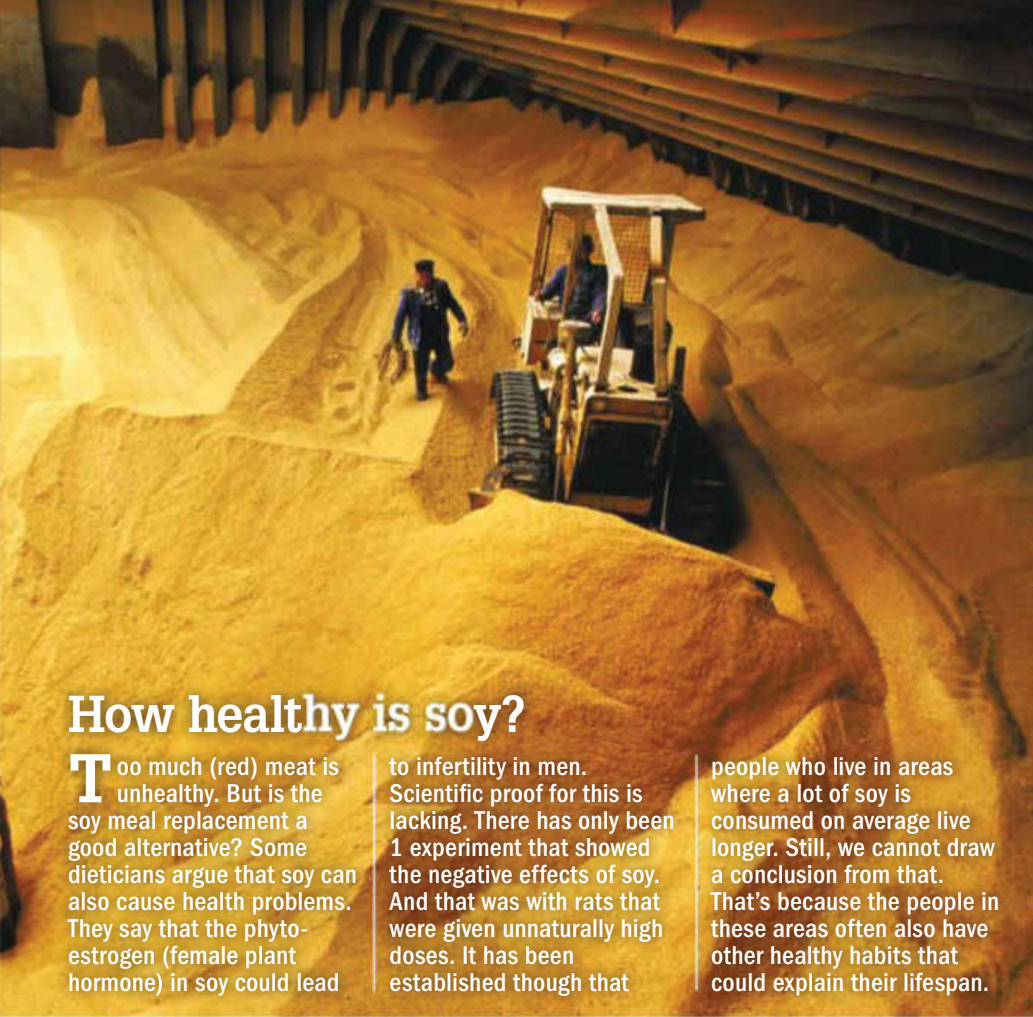
Seaweed makes a great salad and creates a salty taste that makes it taste like fish.

structure with some effort. This happens by kneading the mixture, stretching and pushing, and varying the temperature and pressure during the process. The soy paste is then pushed through the screw at various speeds. In some places it is heated up and in others cooled down. Extra water is added if needed.

## ● Something fishy

The company has refined the process





## How healthy is soy?

**T**oo much (red) meat is unhealthy. But is the soy meal replacement a good alternative? Some dieticians argue that soy can also cause health problems. They say that the phyto-estrogen (female plant hormone) in soy could lead

to infertility in men. Scientific proof for this is lacking. There has only been 1 experiment that showed the negative effects of soy. And that was with rats that were given unnaturally high doses. It has been established though that

people who live in areas where a lot of soy is consumed on average live longer. Still, we cannot draw a conclusion from that. That's because the people in these areas often also have other healthy habits that could explain their lifespan.

so it can make all sorts of meat structures: from chicken to pork to tuna. It does this by varying the temperature and pressure in the extruder and thus varying the length of the fibre and the 'bite'. Chicken, for example, has longer fibres than pork. Tuna is more layered. The only thing needed to make a completely different meat type is some different configurations. To prove this, we tasted an amazingly good imitation of pork. The only thing missing is the holy grail of meat: steak. Nobody has managed so far to come even close to what it should be like. Ojah is also not going to gamble with that, says commercial director Jeroen Willemsen. The

company wants to concentrate on its most popular meat: chicken. It is also now important to start producing imitation meat in a cheaper way. While the product might be just as nice as real chicken, if it isn't cheaper than real chicken many people will probably not buy it. ■

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## Is fat a sixth taste?

**A**s if the revelation of the fifth taste was not enough, recently another taste has been discovered, namely fat. How well we can taste fat differs from person to person. Also, people who taste fat better appear to have a lower BMI. This means that they have less body fat themselves. Recognising fat probably also gives our body a warning signal that we are full. On the other hand, research shows us that endocannabinoid is found in fat. This is a substance that makes us binge. It helps with the so-called 'keep on eating' effect which usually leads to us finishing a packet of chips in one go. Another reason why fat keeps us eating is because of the taste-enhancing effect. Fat ensures that the aromas of, for example meat, escape at a slower rate. Little wonder that we can't leave the fries and hamburger alone.

## The taste of mother's milk

**F**or many decades, we were taught that there are 4 basic tastes that our tongues can taste: salt, sweet, sour and bitter. Since the beginning of the last century a fifth taste has been known in Japan: umami, meaning 'delicious taste'. It is the taste that we call 'hearty' or 'stock-like'. American scientists discovered in 2000 that the Japanese were telling the truth. We have receptors on our tongues for glutamic acid, the substance that is responsible for the nice umami taste of meat. But you also taste this in tomatoes, truffles, old cheese and in Japanese seaweed. Our preference for umami starts as breastfeeding infants. Breast milk contains comparable amounts of umami to stock, our ultimate comfort food.

The imitation chicken doesn't just taste like chicken, it also looks like it.





When you think of Christmas, you probably don't think of this ...

# Season's bleatings

*Christmas, a time for giving and sharing. Yes, the spirit of the season may be the same, but how we celebrate, and the traditions that go along with it, differ vastly. Here are a few unusual Christmas traditions from around the globe.*

■ TEXT: DEANNE DUDLEY / IMAGES: SHUTTERSTOCK

## ■ Tutty fruity

In India, due to the lack of traditional fir trees, many people decorate banana and mango trees instead.

## ■ Matchmaking

To nab a husband, according to Slovakian lore, all the single ladies should stand with their backs facing the door and throw a shoe over their shoulder on Christmas

Day. If it lands pointing towards the door, they're in luck. They'll be married soon.

## ■ Finger lickin' good

Forget turkey for traditional Christmas lunch. In Japan, deep-fried chicken (of the KFC variety) is the meal of choice for most. It seems many years ago, the franchise hired a brilliant mind who created this association so well that KFC

sells more than 240,000 barrels of chicken on Christmas Day. That's up to 10 times its average monthly sales.

## ■ Burning issue

Since 1966, a 13m-tall goat made of straw has been erected in the town square of Gavle, Sweden. And every year, vandals burn it down. This has now happened so many times that bookies have been fielding





bets on the longevity of the annual Gavle goat since 1988.

#### ■ Are your spidey senses tingling?

In Ukraine, legend has it that a poor woman could not afford decorations for her Christmas tree. This made her children very sad. Some compassionate spiders took pity on the family and, while the family slept, they spun webs all over the tree. In the

morning sun, the webs shimmered and turned into silver and gold, making sure that the family was never left wanting again. As such, seeing a spider on Christmas morning is seen as good luck.

#### ■ A blasting good time

It's a Christmas card with a difference for residents in Arizona (US). They can take their family along and have a Christmas

## Did you know?

**D**ue to the fact that no one wants Christmas cake after the 25th, single Japanese women over the age of 25 used to be called Christmas cakes.

photo taken with Santa ... while holding a menacing machine gun. The state prides itself on its gun laws and there is a large variety to choose from, as well as elves who give assistance with safety. Apparently there are queues for this madness.

#### ■ Sweet punishment

Italian children have Santa (called Babbo Natale), but they also have someone else visit them 11 days after Christmas. On 5 January, La Befana, an ugly old witch, climbs on her broomstick and gives extra sweets to all the good children. She's no spring chicken – in fact, she's been around since the 13th century. Her back story: she refused an invite by the Three Wise Men to visit Baby Jesus and really regretted her decision. She now doles out sweets to make up for it.

#### ■ Artist's impression

In Mexico exists a very creative Christmas art festival called La Noche de Rabanos (Night of the Radishes). It's held on 23 December, when artists fashion vegetables into sculptures. There are cash prizes to be won, and over 100 artists compete.

#### ■ Gathering of the white beards

You may have heard of Comic-Con, but did you know that there is a SantaCon? Yes, it was started in 1994 by a group called the Cacophony Society. Originally intended to take a jibe at the commercialisation of Christmas, it developed into an actual event where participants, dressed in Santa suits (or elf or reindeer costumes) meet up and wander around towns. They stop in at local bars, occasionally bursting out into festive song, and throw huge parties, known for their rowdiness and drunkenness. The website has rules of conduct and they try to keep the events under control, but it's mostly a lost cause. And it happens all over the world! There was one with 13,000 people in Ireland, and a massive one with 70,000 participants in Moscow.

#### ■ Running Santa out of town

Initially a festivity to ward off evil, the Swiss have a tradition called Klausjagen (literally translated as 'Chasing the Santa Claus'). It's a 2-hour undertaking that begins after dark on 5 December, which is St Nicholas' Day. Villagers parade through the town, cracking whips and ringing cow bells. They wear giant, stained-glass bishop's hats. Quite a spectacle. ■

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What happens if you don't sleep  
for 2 nights?

# The wakeful dead

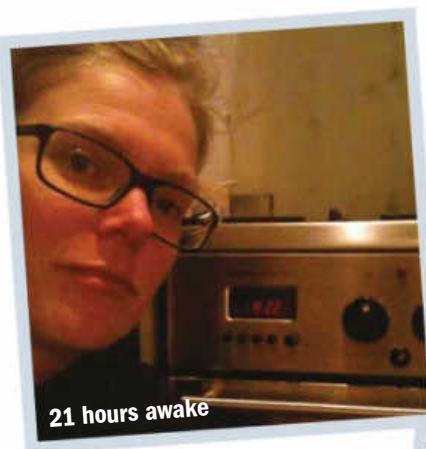
*On average, most people spend about a third of their lives sleeping. How important is getting a good night's rest and what happens if we don't sleep or don't get enough? Elly Posthumus finds out.*

■ TEXT: ELLY POSTHUMUS



### Sleepless nights

The first night awake was productive as I got stuck into chores. The next day was a challenge to stay awake and not even a second jersey could keep me warm. By the end of the second night, my body was in a complete state of shutdown.



## A large part of your body shuts down when you sleep but your brain is still hard at work

**M**y brain usually tells me around 11pm that it's time to go to bed. I begin to yawn and feel tired. This time I ignore the sleep signals; the plan is to not sleep for 2 nights. The first few hours are pretty okay. But halfway through the night my eyes begin to sting and I yawn like crazy. The urge to sleep becomes stronger towards 5am. I do some work to stay awake. I tidy up some cupboards and fold the laundry that has been lying around for a week. A shirt with little vertical stripes makes me dizzy. Even though it's warm, I start to shiver. At 8am I get dressed, yawning all the way on my drive to the office. What else is this lack of sleep going to

do for me today? And why is sleep so important?

#### ● Sleepy head

My day in the office gets off to a slow start. My head feels heavy and foggy. The fatigue prevents me from focusing my eyes on the computer screen. I can hardly manage more than a 3-minute attention span. I keep opening the wrong files on my computer. I work on 3 files at the same time, but when I click from one window to the next I have already forgotten what I was supposed to be doing. I can hardly keep my eyes open. I go to the gym during my lunch hour. After that the day is remarkably easy. It almost seems as if the fatigue has

completely gone. But as soon as I get home, I collapse.

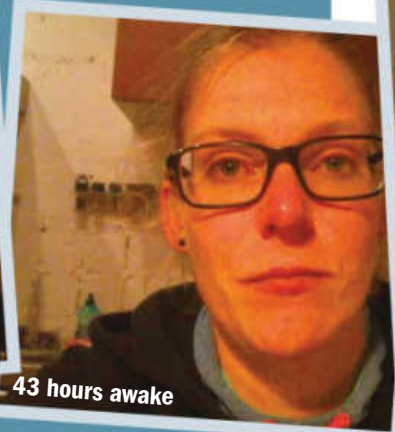
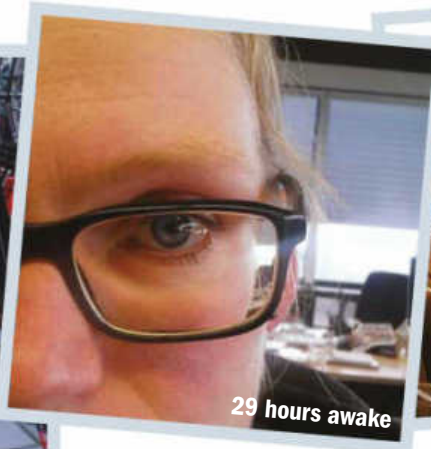
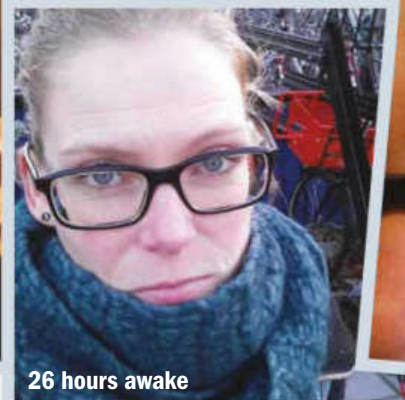
"Sleep deprivation first affects your brain function," explains Peter Meerlo, a sleep researcher and professor of neurobiology at the University of Groningen (NL). "Sleep is primarily important for your brain and a large part of your body and your muscles could do without it," he suspects. When you have worked the whole day in the garden or exercised a lot then you could get over the physical tiredness. However, that does not work for your brain. It really needs that sleep.

#### ● Brain is constantly active

It is important to remember that your







## Emotional sleeplessness

**G**rumpy after a night without sleep? Make sure that you do fun things. This could change your mood. "There are plenty of people who become quite jolly from a sleepless night," states Peter Meerlo. Why is that? From research in which people looked at emotional images it is known that their reaction to these images becomes stronger when they are sleep deprived. It does not matter whether the images are negative or positive. Meerlo adds: "You also see that in the brain. Their amygdala reacts stronger." This is the part of the brain that is involved in emotional reactions. This part of the brain is normally kept in check by another part of your brain, the frontal cortex. This part becomes less active when you are short on sleep. It can no longer regulate the amygdala. And thus it will react stronger. So whether a lack of sleep makes you grumpy or happy depends on the circumstances.

brain never switches off. Even while you are asleep, all sorts of things happen in your brain. "But your brain activity does change," adds Meerlo. All your brain cells are busy with their own tasks when you are awake, such as the processing of information or the delegation of movement. Your brain cells synchronise their activity when you fall asleep. They fire impulses in large groups, followed by a short break during the so-called non-REM sleep state. But this does not continue the whole night. "There are 2 types of sleep," explains Meerlo. "After a while you land in the second sleep state, the so-called REM

**During the REM sleep phase, your brain's activity is the same as when you are awake.**

sleep state. The electric activity of the brain is then the same as if you are awake. Your nerve cells are then also very active. Your eyes move up and down fast. That is where the term 'rapid eye movement' (REM) derives its name from. The cycles interchange during the night from non-REM to REM sleep. One cycle lasts about 90 minutes. Depending on how long you sleep you will have 5 or 6 turns of each cycle per night."

### ● Waste has to go

It is clear that all sorts of things go on in your brain, but it is uncertain why this happens. Scientists are undecided about why we have these 2 sleep cycles. In fact, it is not very clear why we need sleep. There are various theories about it but none of them have been proven. One theory is that sleep is a sort of repair process. According to researchers at the University of Rochester (USA), all sorts of poisonous waste matter from your brain is disposed of when you sleep. Waste matter, like the protein beta-amyloid, plays a role in the development of Alzheimer's and other neurological disorders. The researchers also discovered that your brain cells shrink a little during sleep. The brain fluid can easily get rid of waste in the blood circulation because the spaces between the brain cells are a bit larger then. The researchers think that this drainage is mainly active during sleep. The pumping around of brain fluid requires quite a bit of energy. And there is

## Sleep enforces trauma

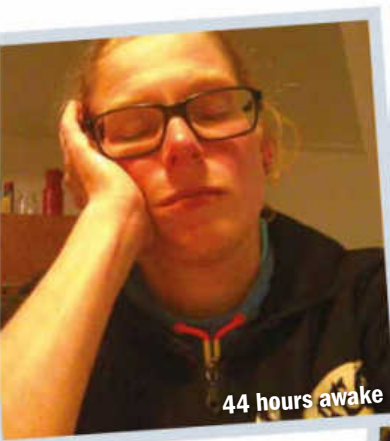
**H**ave you witnessed something terrible like a car accident or a violent crime? Then it might help to skip a night straight after the upsetting experience. This was discovered by researchers from Yale University (USA). They showed test persons movies about happy road trips and trips in which fatal accidents occurred. Half the test persons were allowed to sleep. The other half was kept awake. It appeared that the sleepless viewers reacted less fearfully to frightening stimuli than the sleeping viewers. This is probably because sleep plays a role in the forming of memory. The trauma is embedded into your memory less without sleep. A sleepless night could possibly even prevent post-traumatic stress disorder, according to the researchers.

simply not enough energy to clean your brain and process information actively during the day.

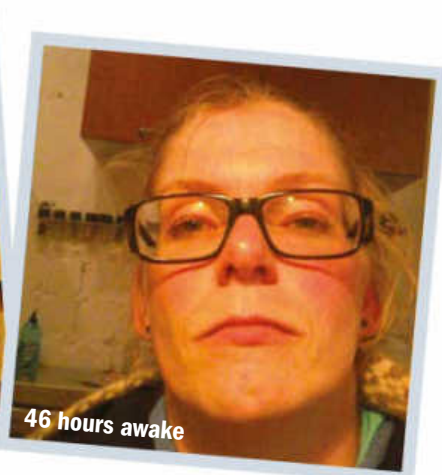
### ● Loss of energy

I don't know if my brain is full of waste matter, but my head does feel a bit foggy and fuller. Meerlo explains: "It is also quite possible that during sleep you resupply substances that have been depleted during the day." You deplete the energy supply in your brain when you are awake, according to a second theory. My brain energy supply seems quite depleted after a night and a day without





44 hours awake



46 hours awake

## You can't fight the need for sleep forever and you could even fall asleep standing up

► sleep. Meerlo states that it could well be that because of a lack of energy, the brain areas are no longer capable of performing their normal activities. This seems to make sense to me. I can still function but I can't seem to keep warm and I struggle to see clearly. It seems as if I can only function on a basic level and that my brain is on autopilot. This is not very clever. When I come home after work I hang my keys on the coat hanger instead of my jacket. It also takes long before I realise my error.

### ● Cells change

However, sleep deprivation brings on more than just a lack of energy and the collection of waste substances. My memory also does not function properly. How is that possible? It seems as if all sorts of structural changes take place in your brain when you sleep. Our brain consists of billions of nerve cells. Every nerve cell has all sorts of endings that make contact with one another. The nerve

cells communicate with one another by giving off signal substances at such a contact point. Every cell has thousands of contact points. They are flexible, can enlarge or shrink, disappear completely or regenerate themselves. Communication can vary between nerve cells and brain areas in this way. There are various theories that conclude that the contact points that are made during the day are strengthened, or actually disappear. The

former is particularly useful when you have to remember something. When your brain stores something and you want to hold on to that information, it can be done by making the contact points between the nerve cells stronger. Sleep indeed plays an important role in enhancing your memory. Meerlo adds: "Certain learning tasks such as finding your way in a maze or playing piano are remembered better after a good night's rest than if you get no shuteye."

## Sleepless to the end

**F**ortunately this is a rare hereditary disorder. Worldwide it only occurred in about a dozen families. Whoever gets hit by fatal familial insomnia will struggle increasingly with insomnia. After a while you will get panic attacks and hallucinate. Those who cannot sleep at all after a few months will lose weight rapidly. They also develop a sort of dementia and don't react to their surroundings in the end. However, they are still completely aware of their situation. The patient dies within 7 to 18 months after the first sleeplessness occurs. There is unfortunately no treatment for this disease.



HOLLANDSE HOOGTE



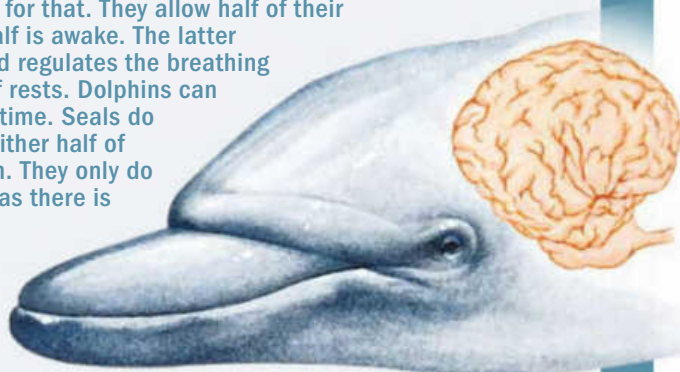
## Sneaky sleep

**Y**ou might think that you are wide awake, but that remains to be seen. Researchers from the University of Wisconsin-Madison (USA) discovered in 2011 that small parts of the brain can sleep while you are awake. At least that is the case with rats. The researchers measured the activity of various brain cells in rats. While the rats were active, it seemed like some of these cells behaved as if they were asleep. This occurred more often the longer the rats were kept awake. These 'micro-sleeps' can hinder your function quite a bit. Rats that had not slept were less adept at functioning compared to those test subjects that were allowed to sleep.

## Half-awake dolphin brain

**H**ow do you breathe when you sleep under water? This can be a problem for mammals. They have lungs and so have to surface now and then to breathe. They could die if they fall asleep under water. Dolphins and other sea mammals have found a solution for that. They allow half of their brain to sleep while the other half is awake. The latter co-ordinates the movements and regulates the breathing at the surface. The sleeping half rests. Dolphins can only switch off 1 brain half at a time. Seals do this even better. They can rest either half of their brain or the complete brain. They only do the latter when they are ashore as there is no danger of drowning.

**A dolphin is never fully asleep.**



GETTY IMAGES

Fortunately, I don't have to learn anything these days. So my lack of memory does not bother me too much.

### ● No sleep will kill you

Just because I don't notice things straight away does not mean that nothing is happening. Meerlo adds: "If sleep plays a role with fundamental cellular processes such as the cleaning and maintenance of nerve cells and the regulating of contacts, then it is logical that a lack of sleep has

serious consequences in the long term." From various studies it appears that a lack of sleep already has adverse effects on your immune system after just a few hours. People who sleep too little get sick sooner when they are exposed to infections. I don't notice any change to my immune system even after 39 hours without sleep. But researchers at the University of Chicago (USA) took it a little further. They kept rats awake for a few weeks in succession. After 32 days all the rats died. Whether people also die if they never sleep again has never been studied for ethical reasons. Furthermore, not only are the acute consequences of sleep deprivation dangerous, but all types of psychiatric disorders, heart disease and diabetes are linked to sleep deprivation. So, it could very well spell an early death for you.

### ● Sleep wins

The second night without sleep is a lot more challenging. I am listless and have no energy to do anything active such as cleaning my apartment. Everything in my body says that I must sleep. I sort out the bookcase at 5am with my last little bit of energy. I do this sitting down. But my head suddenly drops down. "Your muscle tension becomes gradually less when you fall asleep," states Meerlo when I call him to ask him what I am experiencing. "First, your neck muscles weaken," he says. "That is why your head begins to bob. The sudden jerk will startle you." I continue sorting, but only a moment later it happens again, and again. I walk around aimlessly because I doze off as soon as I sit down. "The urge to sleep is uncontrollable. In the end it does not matter where you are or in what position you are. You can even fall asleep while standing." To prevent that and other health issues, I dive into my bed at 7am. ■

[braintainment@panorama.co.za](mailto:braintainment@panorama.co.za)



**Trouble sleeping? Visit a sleep clinic where all kinds of brain and body activities are measured.**



**Sleep-deprived NASA employees may have caused one of the worst disasters in space exploration history.**

## Dozing-off disasters

**F**atigue plays a role in accidents more often than you think.

■ Space shuttle Challenger broke into pieces 73 seconds after launch in 1986. All 7 crew members died at the scene.

According to the official research report this was partly due to lack of sleep. A number of NASA managers who had to make important launch decisions had worked some long shifts and gotten less than 2 hours of sleep.

■ Shifts of 24 to 36 hours are a regular occurrence in hospitals. According to research by Harvard University this causes quite a few medical mistakes due to the lack of sleep. According to the researchers, the number of such mistakes can be lowered by giving the doctors more time to sleep. A shift of maximum 16 hours in a working week of 80 hours at the most could already result in 36% fewer mistakes.

■ According to research from the American Academy of Sleep Medicine about 20% of all road accidents in that country are as a result of driver fatigue.

GETTY IMAGES



ARCHAEOLOGY

## Wrongfully accused

These two skeletons may very well belong to a group of individuals who met their fate because of mistaken identity.

NATURE

## Vulture eats deadly diet

**R**otten meat can make you very sick, but not when you are a vulture. Biologists from Aarhus University (Denmark) recently discovered why this is the case. They studied 50 vultures in the USA that ate dead animals found along the road. They discovered that the birds had no fewer than 528 different types of bacteria on their heads, but only 76 types in their stomachs. How is that possible? It's partly because the stomach and colon of vultures are extremely acidic, where lots of bacteria cannot survive. But what also counts is that vultures are resistant to clostridia and fusobacteria. Many other animals die when they ingest such bacteria, but vultures benefit from them: they kill many other bacteria in the colon of the vulture. As such, only a few bacteria remain that can make the vulture sick.

JOHN CANCALOSI/GETTY IMAGES



### Shorts Ahead of the curve

- You can get quite a serious bout of food poisoning from clostridia and fusobacteria.
- Fusobacteria increase your chances of colon cancer.
- It is not known why vultures are resistant to these bacteria.





GREGORICKA ET AL

**T**here are 6 vampires buried in a cemetery in Drawsko (Poland). Well, that's what they thought in the 17th and 18th centuries. The 6 were buried with iron brackets around their neck or with a stone in their throat, so that they couldn't escape their coffins at night. For a long time it was assumed that the 'vampire-like' people were immigrants (an old case of xenophobia? – Ed). Researchers from the University of South Alabama (USA) have now discovered that the vampires were locals. There is a certain combination of chemical elements in the teeth that only occurs in people who grow up near Drawsko. So why were they buried as vampires? The archaeologists think that the dead had been cholera patients and had looked suspicious and thin, just like vampires.



ALMA

As the saying goes, it is written in the stars and some stars are just meant to never be alone.

## SPACE

# Double-star formation revealed

**S**cientists theorise that the sun developed from an enormous cloud of gas and dust that clung together in the middle because of gravity. Sun-like stars elsewhere in space often have a second star with them. These are called double stars and also arise from a cloud of dust and gas. Astronomers from Academia Sinica (Taiwan)

have now seen for the first time how such a cloud moves during the formation of a double star. It appears that the cloud in fact consists of 2 U-shaped discs in which the gas and dust have various speeds at different places. This means that they come together at not 1, but 2 places: the primary (heavier) and the secondary (lighter) star.

## Shorts Ahead of the curve

- Double stars are probably more abundant in space than isolated stars like the sun.
- The most well-known star sign, the Big Dipper, shaped like a saucepan, also has a double star.



JUERGEN KESSELMEIER

At 325m, the mast is higher than the Eiffel Tower.

## ENVIRONMENT

# Mast measures gas

**P**ictured here is Atto, a 325m-high mast in the Brazilian rainforest. Its purpose is to map the interaction between the atmosphere and the jungle. Atto comprises many pumps and sensors. These suck up air at various altitudes and analyse the composition. Such analyses can determine how much carbon dioxide (CO<sub>2</sub>) it contains and how much methane and other greenhouse gases are present. This varies quite a bit. Trees breathe in CO<sub>2</sub> during the day while they breathe out oxygen at night. This interaction has consequences for global climate patterns because the Amazon is so vast. Atto's creators say the mast can map a more precise image than what we can make with computer simulations.



# Powerful stone

## Glued stones

**H**ow do you get a block into the right shape for a building? Simple. Pour some concrete paste in the right mould, wait a few weeks and hey presto! You have your building block. Concrete is nothing more than artificial stone. You make it from sand, gravel and broken stones, cement and water. The secret is in the cement. That mainly consists of heated and finely ground limestone and mudstone. When cement powder touches water in the concrete mill it forms a sort of superglue that sticks sand and gravel together properly. How? The minerals in the cement pebbles react with water. Different crystals grow from each grain, depending on which mineral reacts with the water. With enough water the crystals grow in and over one another and so bridge the space between the various cement particles. Everything that is in between, such as sand and gravel, is then captured in a strong net of hard cement stone. Once poured, an enormously strong artificial stone is formed within a few weeks.

*We drive over it, live in it and even sail in it. Concrete is very old, very strong and one of the most manufactured products around the world.*

■ TEXT: ELLY POSTHUMUS

## Old stone

**T**he Ancient Romans knew how cement reacted with water. They used this principle to make a sort of super concrete with which they built all sorts of impressive buildings such as the Pantheon. They used pozzolana (a volcanic dust) and ground limestone or

plaster. This knowledge was lost when the Roman Empire collapsed. British engineers only discovered the secret again at the end of the 18th century. With all sorts of consequences. Concrete is now one of the most used building materials in the world.

## Steel skeleton

**C**oncrete can withstand enormous pressure. Pulling forces do cause a problem, however. Suppose that an enormous weight leans on the middle of a concrete bridge so that it bends. The concrete on the top side of the bridge is then pushed together while it is pulled apart a little at the bottom. This makes the

construction weak. Frenchman Joseph-Louis Lambot (1814-1887) found a solution for this problem: insert steel wires into the concrete. These are very capable of withstanding strong pulling forces. Today, almost all concrete is made with such a steel skeleton. This is called reinforced concrete.

ALEX AND LAILA/GETTY





## Bacteria against concrete

**I**s reinforced concrete indestructible? Not really. Sooner or later little tears appear in the concrete. Rain or groundwater can then reach the steel in the concrete. The steel then rusts away. Once rusted it cannot withstand the forces. Then, there is a risk that the whole construction could collapse. You can prevent this by repairing the cracks in time. But then you have

to be able to see them and this becomes difficult when the construction is underground or underwater. Now, concrete technologists have created a sort of concrete that can repair itself as soon as a crack appears. How does it work? There are tiny capsules full of sleeping bacteria with a food source in the concrete mixture. They only become active once they touch water. This happens when

tears appear and the capsules crack open. The bacteria can survive for up to 50 years in the concrete while 'sleeping'. Once contact with water has been made the bacteria eat all their food, calcium lactate. This is transformed into limestone. That is a natural cement. The single cells close the fresh cracks in no time.

## Floating on concrete

**S**hips are usually made of steel. But when this is scarce, reinforced concrete is a good alternative. The shipping industry regularly used concrete to manufacture their ships during WW1. Today, you can still see concrete rowing boats, canoes, barges, sailing boats and even oil tankers.

## Cracks in concrete? No problem. Built-in bacteria can fix them straight away

## Concrete houses

**A**merica had a shortage of houses for people with little money at the beginning of the 20th century. Inventor Thomas Edison (1847-1931) came up with a solution: an indestructible house made from 1 type of building material. It had to be strong and cheap. Concrete complied with this. And it was not only the house that Edison made from concrete. He also manufactured furniture, a piano and a record player. He made them from concrete that he filled with air so that it remained as light as possible. He painted them with a special paint so that the whole structure looked wooden. The concrete houses, of which the first ones were made in 1917, needed an enormous mould. This was quite expensive but as Edison claimed, the more houses he made, the cheaper his plan would work out. Technically everything worked. Still, the houses were not a success. This was mainly due to the fact that nobody wanted to live in a house that was especially made for the less fortunate. A number of his sample houses are still standing in West Orange, New Jersey.

## Concrete records

**Y**ou can test all your strength with concrete. Just be careful not to use reinforced concrete.

■ In 2011, American wrestler John Ferraro sat on his knees and held a pile of 45 concrete blocks that balanced on his head. His assistant then dropped a 7.3kg bowling ball on the pile. The result: Ferraro is now the world record holder of breaking concrete blocks on the head with a bowling ball. He broke 12 in half. The concrete blocks were 1.2m long, 30cm wide and almost 8cm thick.

Each block weighed 90kg. In 2009, Sri Lankan Wasantha De Zoysa broke all of them with 1 hit from his head. He holds the world record for breaking concrete blocks with a single hit of the head.

■ In 2010, Turkish Ali Bahcetepe only needed a minute to break 1,145 concrete blocks of the same size. Using both fists at the same time, he would bash 10 concrete blocks that were assembled on the right and left of him. This power exhibit gave him the world record for breaking concrete blocks in 1 minute.



## What is the most consumed product on Earth?

Charlotte Emerson, Johannesburg

**T**he food product that is produced the most is sugar cane. 1,842 million tons are delivered every year. Rice is in 2nd place with 738 million tons. Wheat takes 3rd place with 671 million tons. These products are not consumed in their pure form. They are processed with other food substances. For instance, wheat is used to make bread and pasta. Sugar is found in cool drinks and biscuits. If we purely look at end-products, then rice is probably the most consumed product in the world. If one takes into account liquid

products, then water is the most probable winner. However, it is known that Coca-Cola is consumed more than water in Mexico.

### Q&A **FLASH**

- The World Health Organisation recommends that one consumes not more than 25g of sugar per day. But on average we all exceed that by far.
- Of all countries Brazil consumes the most sugar: 182g per person per day.



All sugars used to be made of sugar cane up until 1800. Then the sugar beet was introduced. About 220 million tons of sugar beet is produced annually.

AFP/GETTY IMAGES



## Why do elderly ladies often have short hair?

Fred Kayembe, Johannesburg

**T**his is partly because our hair doesn't always look that great when we age. It is less full and more brittle. Many women also think that short hair looks better. It could also be that long hair at an older age is not socially accepted. That's because long hair is

associated with youth and sexiness. Women above 50 who still try to be sexy may be seen by many people as pitiful and desperate. So as a woman of above 50 you have to be very sure of your case if you want to wear your hair down.

SHUTTERSTOCK





SHUTTERSTOCK

## Why are there so many different

Leon Peters, Durban

**T**his is because they are developed by different companies. Each gives its screw and bolt heads their own design. The early screws all had a saw cut,

suitable for screwdrivers with a flat head. These screws are cheaper to make, but a screwdriver has little grip on these. With the rise of the screw machines at the beginning of

the last century, new variants were introduced.

The Phillips Screw Company (US) introduced the cross-head in the 1930s. Others introduced the Allen

key, the torx and even more different heads for more grip. Companies could make all the heads uniform, but in this way they sell more tools.

## Why do jazz and pop artists always play without score sheets while orchestras panic if they can't find their sheets?

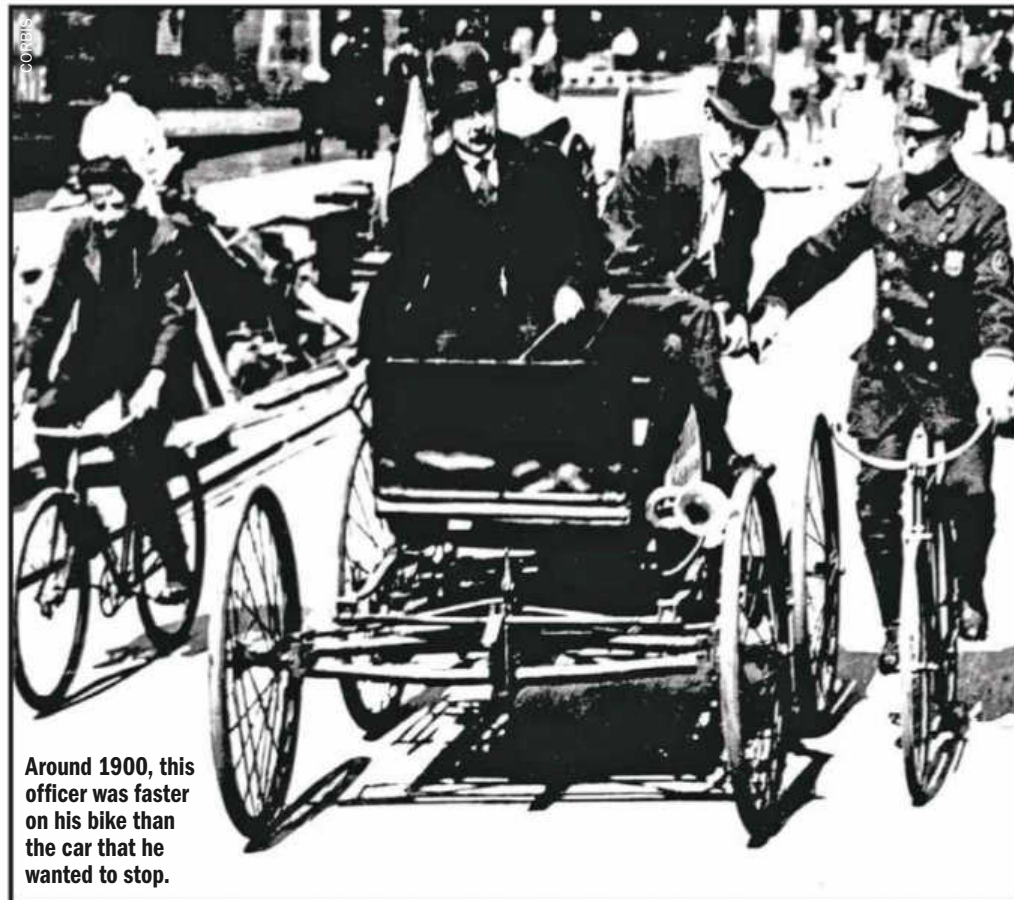
Deanne O'Riley, Bluff

**T**here are a few reasons for this. Firstly, classical music is usually more complex. Also, those music pieces are longer than other genres. Classical music is meant to be played precisely as it was composed. Pop and jazz musicians can improvise a little and deviate, while this is not appreciated with classical music. Most bands practise a lot longer for a live performance than an orchestra. Finally, an orchestra plays a number of music pieces and a few months later they might play new compositions, while rock and jazz bands often play the same tunes for years. There are, however, often soloists in a classical orchestra who do know their pieces by heart. They often stand up during their solo and then

there is no space for a score sheet. Soloists therefore have to practise more.

### O&A **FLASH**

- A partiture is the complete summary of a piece of music.
- On 1 page all types of various instruments or voices are listed from top to bottom.
- The conductor keeps the performance in check with the aid of the partiture.
- 'Partiture' is derived from the Italian word *partitura*, which means division.



Around 1900, this officer was faster on his bike than the car that he wanted to stop.

## When was the first traffic fine issued?

Glen Samuels, Johannesburg

**T**he first traffic fine was issued in 1896 in East Peckham, England. Walter Arnold drove his car

at 13km/h in a 3km/h zone. He had to pay a shilling at the scene. Three years later, a New York taxi

driver received a written traffic fine for driving 19km/h in a 12km/h zone.



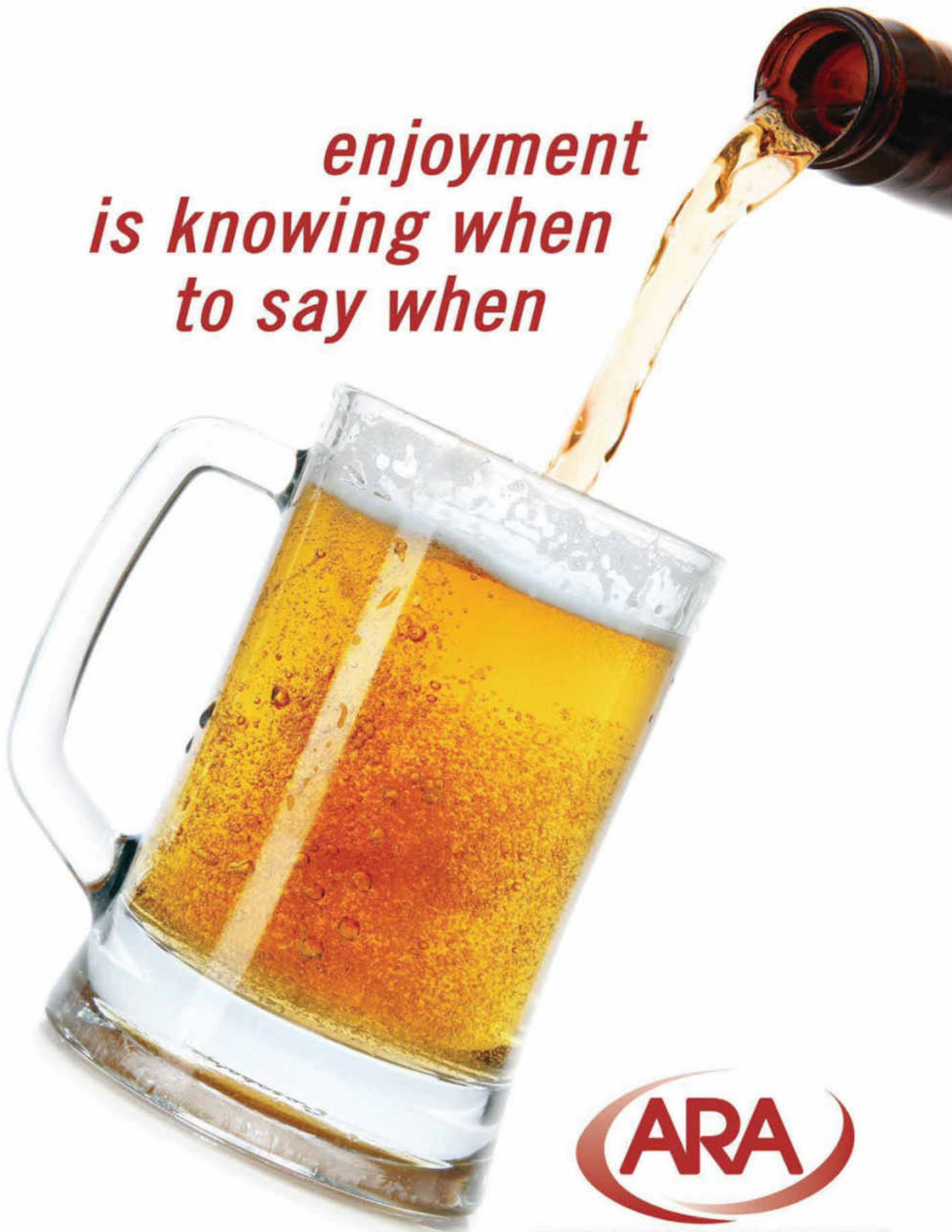


## What lies beneath

**A** giant stingray lies in wait for its prey at the bottom of a river bed in Borneo. Unknown to scientists until 1990, the giant stingray is one of the largest species of fresh water fish in the world, growing up to 5m and weighing as much as 600kg.



*enjoyment  
is knowing when  
to say when*



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SHUTTERSTOCK

## Why are there 2 shift buttons on a keyboard?

Zafar Khan, Laudium

**T**he simple answer is to make it easier to type faster. Touch typing is done with 10 fingers with each hand covering one half of the keyboard. If you want to type a capital letter with this method, you could push down shift with a finger of the one hand, and use the other hand to hit the letter. If the capital letter is on the left of the keyboard, you will use the shift on the right and vice versa. Typing would be a lot slower with just 1 shift button.

### Q&A FLASH

- American secretary **Stella Pajunas-Gernand** holds the, still unbeaten, world record of 216 words per minute since 1946.
- The record for touch typing stands at 830 hits per minute.

# How many people will there be in the world in the year 3000?

Marie Wynand, Bloemfontein

**T**here is no demographer who will dare to make predictions for the year 3000. That's because so many things could happen that every prediction about the number of people in 1,000 years would be useless. There could be an enormous natural disaster, and nobody would be left. However, if humankind keeps on growing, there could be up to 100 billion people living on our planet. The United Nations has done a prediction for the year 2300. They got to 36.4 billion in the highest case scenario. The current world population is 7 billion.

SOURCE: NIDI, VN



GERARD FRITZ/GETTY

## Can people be allergic to each other?

Cronje du Toit, Johannesburg

**I**t has never been known that one person was allergic to another person by being in the same area or even by their touch. There is however a sperm allergy. Some people are allergic to certain parts of sperm. However, for such an allergic reaction to happen there needs to be intimate contact.

# Where do honeymoon customs originate from?

Seth Raynard, Lambton

**T**here are different theories about this. The first is that the honeymoon stems from a time when brides were stolen. The groom and his bride would lie low until she was pregnant so that a rival couldn't claim her anymore. Another explanation is that the honeymoon idea originated in India. There it was customary for the bride and groom to travel through

the country after their wedding. The purpose: visiting family and relatives who couldn't attend the wedding. The British would have taken this idea to Europe. This would lead to the first modern honeymoons in the middle of the 19th century.

**And where do these traditional cans behind the car come from?**



LUUK VAN DER LEE/HH





## Q&A **FLASH**

- During medieval times mead was part of a marriage ritual. After the wedding the bride and groom were provided enough mead (honey wine) to last one full moon. They were encouraged to consume this sweet wine to instill good luck in their marriage. Mead was also believed to promote fertility and virility. From that ritual and belief sprouted the term 'honeymoon.'



Why do we lose our tempers  
so quickly these days?

# Short fuse



*Do you find that you get annoyed with other people quicker than you did in the past? Well, you are not the only one. It appears to be a sign of our times as everybody seems more irritable than before. How did we become such an angry species?*

■ TEXT: MARK TRAA





**T**here are those people who will kick, scream and shout just to get their own way. They hardly know any politeness, damage other people's property and only think about themselves. Most of us have met them – 2-year-old toddlers. People are most aggressive at that age, believe most child psychologists.

Thus, the term 'terrible 2s' is very apt. Things can only get better once a child has reached his or her third birthday. The brain is more developed and a child understands instructions better. We will never be as unrestrained and aggressive as in our early days, but some people do try. And it seems that that number is

increasing. Aggression is fast becoming the norm rather than the exception. Why?

#### ● Complaints about brutalisation

"I see, to my amazement, that aggression is getting worse. It is more gruesome than in the old days. Men beat up a passer-by without any reason. They feel nothing when it

comes to killing and maiming." This sounds like a quote that could have been stated only last week, right? Actually, this quote is already 45 years old.

It stems from 1970 when Dutch forensic psychiatrist FM Havermans was interviewed by a newspaper about aggression in society. He thought it was no longer



# Losing your temper will not get you your own way

► under control. He was certainly not the only one to complain about it. That same year, a columnist writing in the *Sumatra Post* in Indonesia concluded that a group of children who called their teacher a 'bastard' were way out of control. And there are countless more examples of complaints about brutalisation during those years. It would seem that people have always complained about the behaviour of other people and have always said that enough is enough.

## ● More sensitive and touchy

However, are we more aggressive nowadays than we were in the past? Nobody knows how long or short our fuses were and a historical comparison is difficult. Still, there are scientists who claim that it is worse these days. "Many researchers think that we have become more sensitive and with that also more touchy," says Dutch sociologist Bas van Stokkom. He wrote the book *What an Idiot!* in 2010. With a lack of numbers we can possibly connect our touchiness to the number of violent crimes, thinks Van Stokkom, because violence is the most extreme expression of frustration. When there is more violence it could be a sign that there is more hidden tension. Crime stats are always difficult to judge: when

the police deploy extra people to catch burglars then the number of convicts will also increase. But even when you filter these types of effects, we still live in a more violent society than our parents and grandparents, says Van Stokkom. So, why do we suddenly have such short fuses? There seems to be some sort of starting point. According

to Van Stokkom, this may have something to do with freedom of expression. Today, we have people rebelling against various laws and trying to get more freedom for their movements. "We have become more empowered," says Van Stokkom (as do many other sociologists). "We are quick to speak and we react faster if we think that our interests

are in danger of being compromised."

## ● Narcissism is rising

But do we only despise someone if their opinion differs from ours? Not quite. What also plays a role is the rise of 'I'. In other words, people who think that they are the centre of everything. They are called narcissists. Van Stokkom claims that they have been given more space since the '60s. Well, they took that space. By demanding things in a high tone, it seems that you can get them done. Sometimes at the expense of others, but then again, the individual (the 'I') is now more important than ever before. Research undertaken by the San Diego State University in 2008 showed that test persons scored 30% more in a narcissist test than people



## We don't want to fight

**A**re we humans really such a violent species? Sociologist Randall Collins, professor at the University of Pennsylvania (USA), thinks not. He wrote the book *Violence* in 2008 in which he claims that violence is very unnatural for humans. We are more geared towards solidarity and co-

operation. We would rather walk away from a fight. When others are fighting we almost never intervene. Randall thinks that people cannot handle the tension of violence any longer: we have simply become too sensitive. Fake violence (like in movies) is still tolerated. On the other hand, take the

reaction to beheading videos from ISIS. It is clear that the majority of us still detest brute force. Of course there are people who think differently about it, but that is a small minority. Are our fuses really shorter? Possibly. But most people don't convert that into violence.



## Blowing off steam

**I**t does feel good to put some text in the comment box on the internet. It calms you down because you blow off some steam. However, that's not how it works. Reacting on the internet works adversely. It only makes you angrier. Researchers from the University of Wisconsin (USA) proved in 2013 that people who rant a lot on the internet also struggle in 'real' life to contain their anger towards other people. Also, if they had read other people's swearing for 5 minutes, their tempers would begin to flare considerably. Even after they had expressed themselves on the internet for 5 minutes, they felt less happy and their anger increased. So blowing off steam does not work for these 'ranters'. The researchers further deduced that it is no good hitting a punching bag while thinking about somebody you hate. Just relaxing for a few minutes is far more effective and gives you a better feeling.



## Busy, busy, busy

**I**t seems logical to think that we have shorter fuses as we get busier. Because when you are busy you are in a hurry and if things don't work out the way you want it you will get irritated quicker. But are we indeed busier?

In January this year, the Citrix Work Life Balance Index revealed a picture of lengthy commutes, inflexible working hours and job roles that are demanding and require frequent overtime. About 20% of office workers are working longer hours than contracted – on average five and a half hours per week. As a result these office workers are putting in 286 hours of free time each year on average. The average commute for the South African worker is 63 minutes per day – 31% of respondents indicated that this is having a negative impact on their health. Office workers could effectively lose up to 559 hours of time per year, between the hours spent commuting to and from work, on average 5.25 per week, and unpaid overtime worked, 5.5 hours per week.

SOURCE: [WWW.BIZNISAFRICA.CO.ZA](http://WWW.BIZNISAFRICA.CO.ZA)



**People with short  
fuses are more visible  
now, thanks to the  
internet**





▶ who did the same test at the beginning of the 1980s. Sociologist Paul Schnabel wrote in 2000 that people who put their own feelings explicitly central have a “raised form of sensitivity for insults.” This in turn leads to an “accelerated tendency to give way to it via behavioural expression.” And that is where the shortened fuse is housed.

### ● Spoilt spells hot-headedness

Van Stokkom is convinced that children who get their own way in their developing years will get irritated when others don't meet with their expectations later on in life. Dutch teacher Willem de Jong wrote in the book *The Spoilt Child Syndrome* that the origin of the maladaptive behaviour of an adult has its roots in the developing years: when you are used to always getting what you want, it is difficult to deal with it when

## Anger in your head

**Y**ou are livid. Your heartbeat increases and your face turns red. Suddenly, you yell out the most terrible things. Without thinking, it seems. Part of the reason for this outburst is that during a rage attack the activity of the orbitofrontal cortex (the area above your eye sockets that processes emotional stimuli) is slowed down. It is the amygdala that

takes over the information processing. The amygdala consists of 2 almond-shaped areas, deep in the brain, where our natural survival instincts are processed. The amygdala works a lot more ‘primitively’ than the cortex. There is no quiet thinking. You will say and do things without realising what the consequences could be. A boost of adrenaline is

released, which makes you super alert. You are in ‘survival mode’. Fighting is the reaction, even if it's only verbal. It can take a while before this mood has ended and your normal thinking returns. You can feel that: you tremble after a burst of anger. Only after a while will you come to reason: the orbitofrontal cortex has taken control again.

you don't get something you want.

Narcissism can be found relatively often in the upper class, it seems from research from 2013 done by Paul Piff from the University of California, Irvine (USA). The higher the social class, the more important you think you are and the more you claim for yourself. Also, highly educated people express their frustration differently than lower

educated people, says Van Stokkom. “Highly educated people often bottle up their frustration and are reluctant to speak to somebody about it. This is logical because they respect the opinions and viewpoints of others. But if they think that their ego really is threatened then they can let rip. Then they can't be stopped,” he states.

### ● Social media ranting

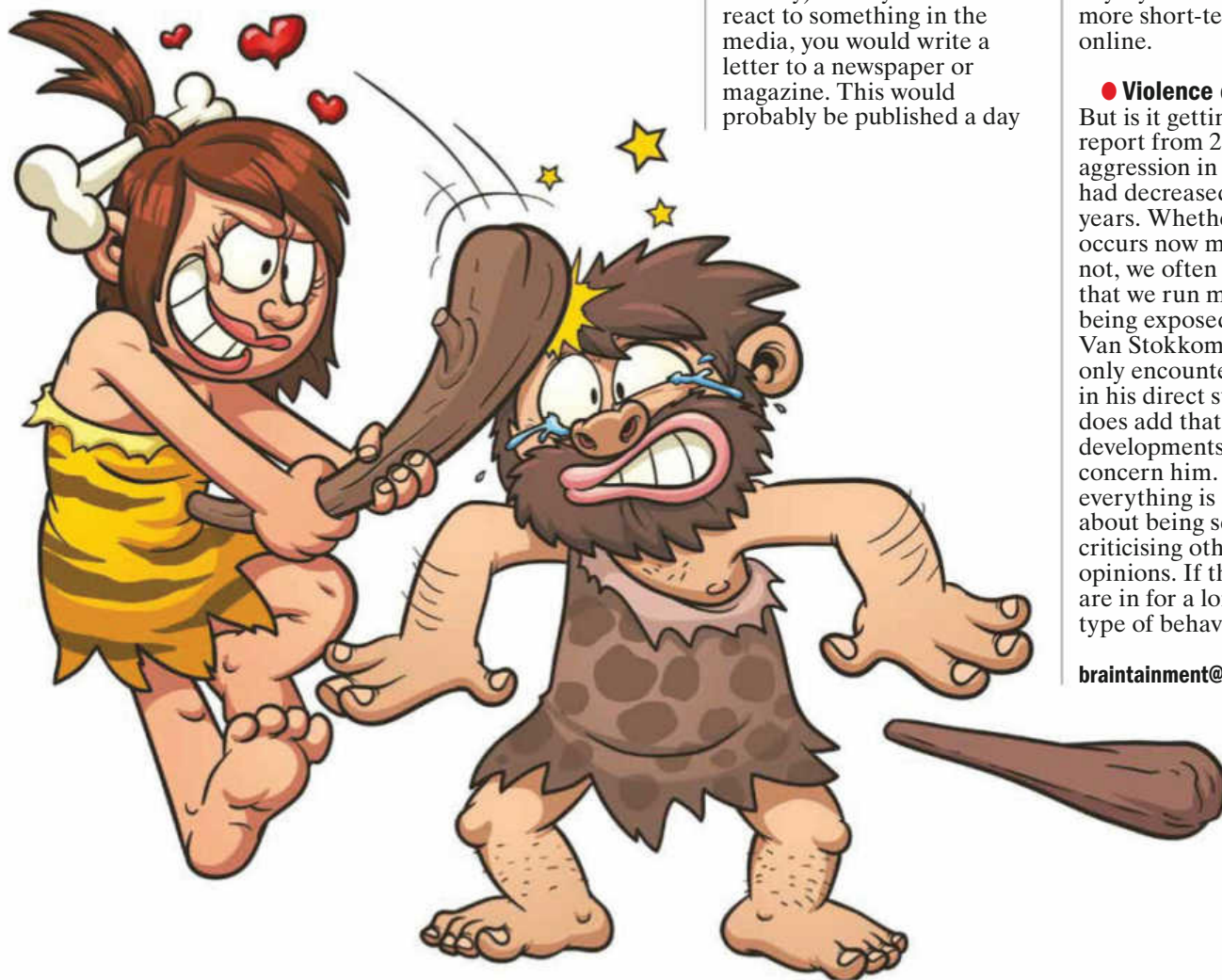
In the good old days (read: before the turn of the century) when you wanted to react to something in the media, you would write a letter to a newspaper or magazine. This would probably be published a day

or even weeks later, in a slightly different format if the editor didn't like your language skills. Now things are very different: your opinion is on the internet in a second. That ‘bastard’ from 1934 has now, 80 years later, changed into somebody you wish dead. The internet is not the cause of short fuses, but it has made people with short tempers more visible. Maybe that is the reason why you hear more often that things are worse than in the old days: you come up against more short-tempered people online.

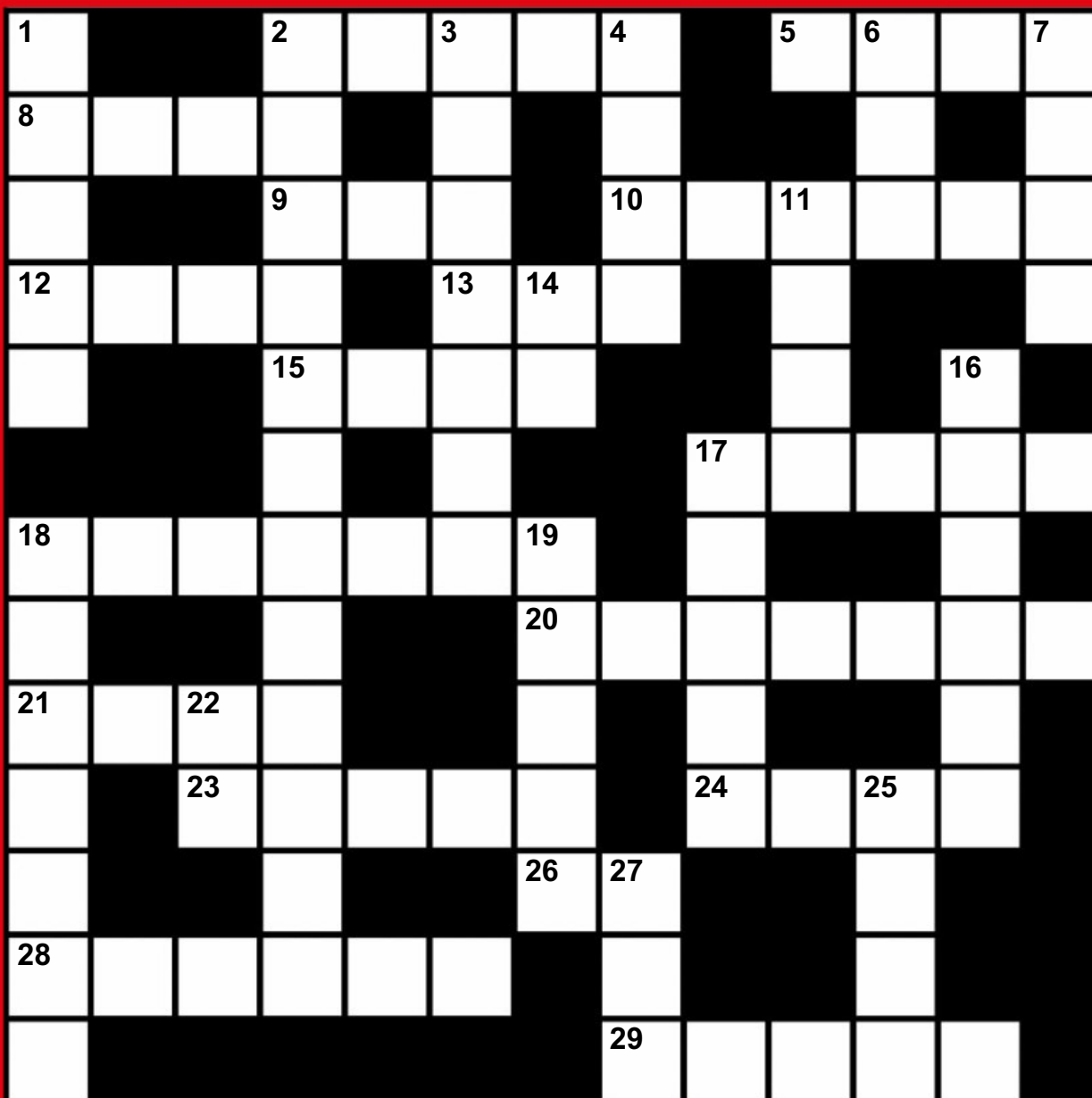
### ● Violence diminishes

But is it getting worse? A report from 2012 shows that aggression in the workforce had decreased in the last 5 years. Whether violence occurs now more than ever or not, we often have the feeling that we run more risk of being exposed to it nowadays. Van Stokkom says that he only encounters nice people in his direct surroundings. He does add that he sees developments in society that concern him. “Today everything is about shouting, about being seen and criticising other people's opinions. If this continues we are in for a long run with this type of behaviour.” ■

[braintainment@panorama.co.za](mailto:braintainment@panorama.co.za)







Across  
2 Amman  
5 Bern  
8 Eton  
9 Tis  
10 Desert  
12 Aura  
13 Sue  
15 Naas  
17 Lanai  
18 Stanley  
20 Anglers  
21 USSR  
23 Wise  
24 Surd  
26 No  
28 Moroni  
29 Eager  
Down  
1 Regal  
2 Antanarivo  
3 Massage  
4 Nude  
6 Eye  
7 Nett  
11 Stoa  
14 US  
16 Hatred  
17 Lagos  
18 Squirms  
19 Yamen  
22 SW  
25 Role  
27 Owe

SNOLLTOS

## CLUES

### Across

- 2 Capital and largest city of Jordan (5)  
5 City in which Einstein worked in a patent office (4)  
8 British school for boys founded in 1440 (4)  
9 Sequel to Frank McCourt's Pulitzer Prize-winning *Angela's Ashes* (3)  
10 Land of sand (6)  
12 Any invisible emanation, such as a scent or odour (4)

- 13 Ambulance chaser's motto! (3)  
15 *Boots & All's* ex-Bok Botha (4)  
17 Tropical condo attachment or one of the Hawaiian Islands (5)  
18 Capital of the Falkland Islands (7)  
20 Hook, line and sinker types (7)  
21 Country that disappeared in 1991 (Think Beatles!) (4)

- 23 TV's big Kobus, who was a Springbok lock in 1995 (5)  
24 A voiceless consonant (phonetics) (4)  
26 Refusal (2)  
28 Capital of the Comoros (6)  
29 Ready, willing and able (5)

### Down

- 1 Befitting a king or queen (5)  
2 AA Not Nirvana is an anagram for

- Madagascar's capital (12)  
3 Trainer's treatment (7)  
4 Like Botticelli's Venus (4)  
6 One with a pupil! (3)  
7 Remaining after all deductions (4)  
11 Where Plato and Aristotle talked (4)  
14 North American republic containing 50 states (2)  
16 Deep dislike (6)  
17 Unscramble goals to find the chief port and

- economic centre of Nigeria (5)  
18 Doesn't sit still (7)  
19 Chinese official's office or residence of a mandarin (5)  
22 Opposite NE (2)  
25 Actor's portrayal of someone in a play (4)  
27 Have obligations to (3)



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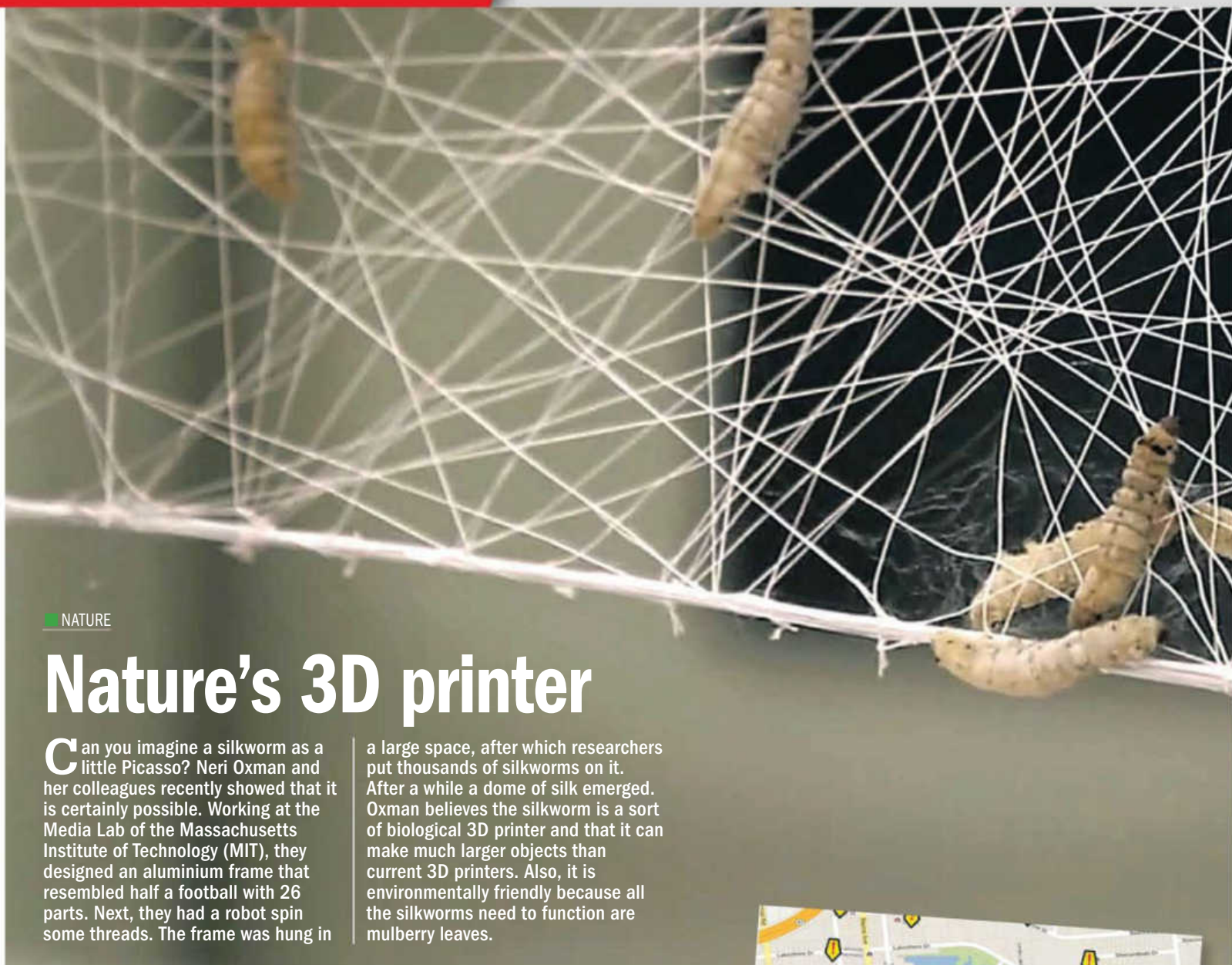
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NATURE

## Nature's 3D printer

**C**an you imagine a silkworm as a little Picasso? Neri Oxman and her colleagues recently showed that it is certainly possible. Working at the Media Lab of the Massachusetts Institute of Technology (MIT), they designed an aluminium frame that resembled half a football with 26 parts. Next, they had a robot spin some threads. The frame was hung in

a large space, after which researchers put thousands of silkworms on it. After a while a dome of silk emerged. Oxman believes the silkworm is a sort of biological 3D printer and that it can make much larger objects than current 3D printers. Also, it is environmentally friendly because all the silkworms need to function are mulberry leaves.

ARCHAEOLOGY

## Europe's oldest woodwork

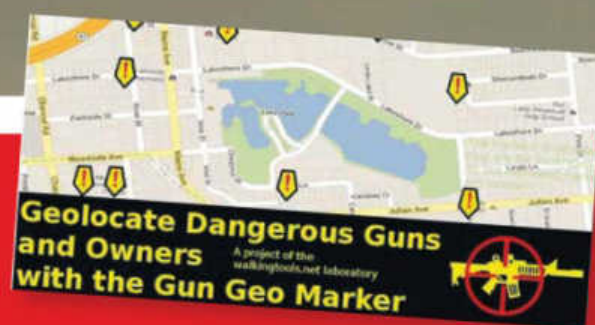
**T**he 12 planks that archaeologists pulled out of a layer of peat in Wales looked very ordinary. That was until Richard Scott Jones of the Heritage Recording Services in Wales had a good look at the oak and saw a series of lines on one of the planks. He thinks they were carved by people who lived about 6,200 years ago. The only known European 'form of art' of comparable age is decorations of earthenware and stones on graves. Jones calls the plank 'one of Europe's oldest wood carvings'. He thinks it might have been used as a border marker by an ancient tribe.

HRS WALES

TECHNOLOGY

## Spot the danger

**T**he United States is often rocked by reports of tragic shooting incidents. It is for this reason that American programmer Brett Stalbaum developed the Gunn Geo Marker app. The app invites users to mark the homes and businesses of "suspected unsafe gun owners in order to help others in the area become



**When in the US, it's best to keep away from the areas highlighted on this map.**

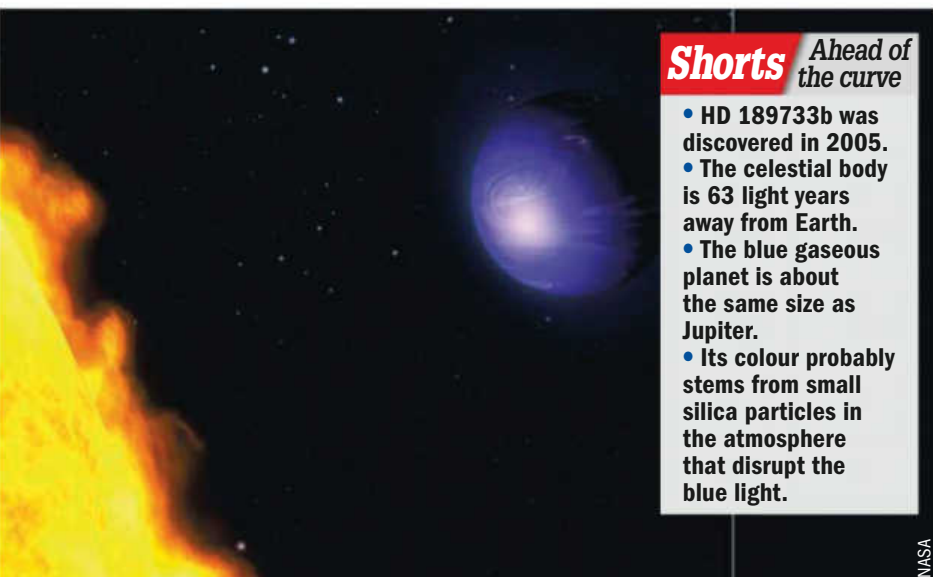
aware of the level of risk from gun accidents or violence." According to the developer, it allows one to avoid places that might be unsafe. However, Stalbaum has received a firestorm of negative reviews and comments from people worried that it could do

more harm than good. Shooting clubs think that it infringes on the privacy of gun owners. And there are plenty of them because the right to keep and bear arms is a constitutional right in America. Gunn Geo Marker can be purchased on Google's Play app store.





The worm masterpiece could possibly be used as a lampshade in a modern museum.



### Shorts Ahead of the curve

- HD 189733b was discovered in 2005.
- The celestial body is 63 light years away from Earth.
- The blue gaseous planet is about the same size as Jupiter.
- Its colour probably stems from small silica particles in the atmosphere that disrupt the blue light.

NASA

### PSYCHOLOGY

## Social media strengthens family bonds

**I**t pays to be friends with your family on social media. Teenagers feel closer to their parents if they are also

connected digitally. This is according to researchers at Brigham Young University in Utah (USA). Of the 500 families that they questioned, half of the teenagers questioned said that they used social media to communicate with their parents. These adolescents seemed more generous, friendly and more helpful towards others. Also, they were less often depressed and aggressive.

### Shorts Ahead of the curve

- A family bond was stronger if they were connected to several social sites.
- Whether a weak bond between a parent and child can improve when you become online friends is unknown.
- Children who accept their parents as friends on social media usually already have a reasonably good relationship with them.



GETTY

### SPACE

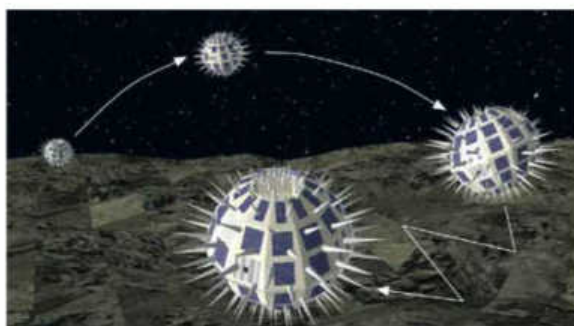
## True blue

**A**stronomers making visible-light observations with NASA's Hubble Space Telescope have deduced that the colour of exoplanet HD 189733b is blue. This marks the first time that we know the colour of a planet outside our solar system. The planet is hardly visible. It reflects little light and is always close to its star. Astronomers used the orbit that the planet makes around its star to isolate the light that the planet reflects from the light that the star sends out. A spectrograph on board Hubble measured the

light of the planet and the star from the moment that the planet appeared in front, next to and behind the star. A little less blue was measured as soon as the planet disappeared behind the star. All other colours appeared to be normal. As a result, the planet has to be blue.

**Forget about taking a trip to HD 189733b. The daytime temperature is nearly 1,000°C, and it possibly rains glass – sideways – in howling 7,200km/h winds.**





■ SPACE

## Hedgehogs in orbit

**W**ithin the next few years, unmanned space probes will likely be launched with about 5 prickly balls on board. Researchers from NASA and Stanford University are currently working on a prototype of the ball, aptly named 'hedgehog', which can explore celestial bodies with extremely little gravity. This has always been a problem for traditional exploration vehicles, because their wheels tend to spin in the dust. The hedgehogs, with a diameter of half a metre, have no problems with this. They have 3 small discs on various spots on their 'tummy' that can rotate at different

speeds to enable navigation. The first assignment for the prickly explorers will be Phobos, the larger of the 2 moons orbiting Mars.

### Shorts Ahead of the curve

- The mother ship will stay close once the hedgehogs arrive on Phobos.
- The mother ship will receive instructions from Earth and relay them to the hedgehogs.
- The hedgehogs, in their turn, will send the information that they collect back to Earth via the mother ship.



■ SCIENCE

## More gulls needed

**I**n the children's book *James and the Giant Peach* by Roald Dahl, a little boy flies over the Atlantic Ocean in a gigantic peach full of insects, which is lifted by 501 gulls. In reality, this is not possible, according to 4 physical science students from the

University of Leicester (UK). The students did a series of calculations based on the book and the Disney film from 1996, and concluded that the fruit would have to be 6m in diameter and 5.7m high. This would mean that a capacity of 4,890,579 Newton would be needed

You can't make a giant peach fly across the ocean with 501 seagulls.

### Shorts Ahead of the curve

- *James and the Giant Peach* (1961) was Roald Dahl's second children's book, after *The Gremlins* from 1943.
- Besides writing books for children, there was a darker side to Dahl. He committed adultery, drank a lot and wrote dark and pornographic (for those days) stories for adults.
- The world's largest peach weighed 725g, according to Guinness World Records. The fruit was cultivated in 2002 by Paul Friday from Coloma (Michigan - USA).

to lift it. That's way too much for 501 birds. After doing the calculations, the students discovered that it would take 2,425,904 gulls to carry the giant peach.

■ BODY

## Wrinkly fingers

**I**t is not uncommon for one to get wrinkled fingertips after taking a long shower or bath. This happens because the blood vessels under your skin contract. Now, biologists from the British University of Newcastle believe that these wrinkles are very functional. They asked 2 groups of people to take beads from a tub filled with warm water. One group held their hands in the warm water for 30 minutes beforehand, so that wrinkles appeared on their fingers. The other group didn't. The test subjects with the wrinkled fingertips had a better grip and could grasp the beads better than those with smooth fingertips. Scientists believe this may have helped our ancestors to gather food from rivers or wetlands.



STIJN RADEMAKER/HOLLANDSE HOOGTE



■ PSYCHOLOGY

## Large eyes aid concentration

**P**osters of cute kittens on your office wall are good for your concentration, according to researchers at the Japanese Hiroshima University. They had test persons play a game called *Doctor Shakes*, whereby they had to use tweezers to remove organs from a doll. The game was over if a person touched the doll. Guess what? When test persons looked at photos of kittens and puppies beforehand, they performed much better in the game. On the other hand, if they looked at adult animals they scored

worse. Researchers think that baby-like features such as large eyes and heads evoke caring feelings. This could improve your concentration levels.



### Shorts Ahead of the curve

- A grave will be soaking wet for 2 to 3 days if you empty 20ℓ water on a 2m<sup>2</sup> grave, according to the research.
- If you still want to make a little garden, use perennials instead of yearlings.

■ ENVIRONMENT

## Green graves pollute environment

**H**ave you planted little shrubs on the grave of your dearly departed? This is not very good for the environment, according to researchers at the University of Kassel in Germany. That's because 2 things happen when you water the plants often. The pores in the soil close and the coffin will be submerged in water. This will prevent oxygen from getting to the body. This doesn't just

slow down the decomposition, but also promotes adipocere (a structure that stops the activity of bacteria). The body will barely decompose and will continue to contaminate the soil. Researchers believe that the problem exists in at least 30 to 40% of all German cemeteries. The solution is not very complicated: put plants in a pot and flowers in a vase.

■ NATURE

## Fish can't stand the heat

**G**lobal warming is not only responsible for rising sea levels and changing weather patterns. Warmer seas could lead to smaller fish. This is what researchers at the University of British Columbia (Canada) concluded. They used computer models to predict the result of climate change on more

than 600 different species of fish. Their conclusion: the maximum bodyweight of the fish could drop between 14 and 24% between 2000 and 2050. Fish require oxygen to grow and warmer oceans mean less oxygen. A decrease in oxygen levels will impede their growth.

### Shorts Ahead of the curve

- Marine life shift their habitats because of the heating up of the oceans.
- Fish in tropical regions are expected to be most affected.
- The largest fish in the world is the whale shark. It can weigh more than 20 tons.



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THIS ISSUE'S HIGHLIGHTS ON 1 PAGE



## Happy new you

Time for a change of lifestyle? Find out how to stick to your New Year's resolution. Page 10

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## Good vs evil

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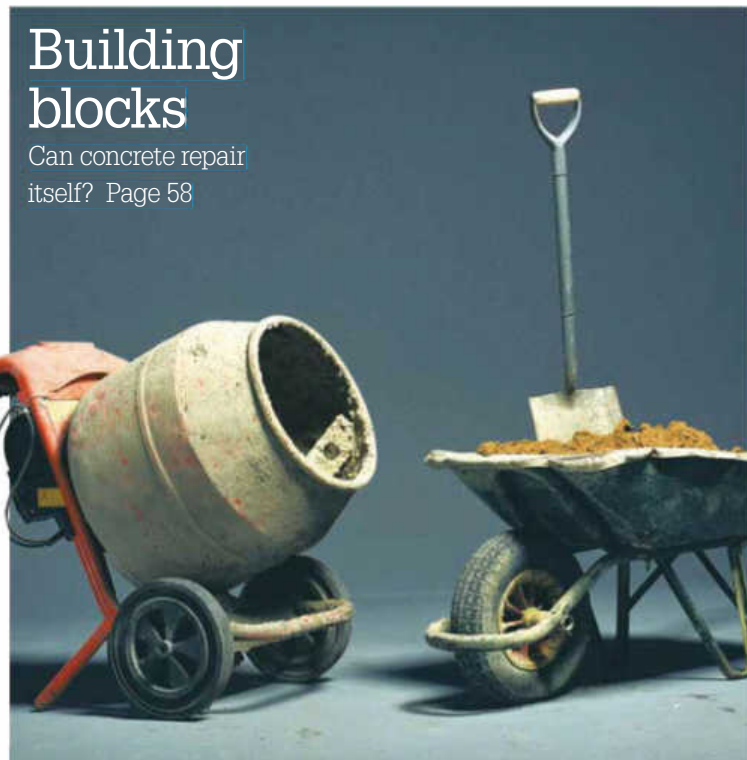


## Nuisance inventions

Modern creations that have added inconvenience to our lives. Page 28

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Can concrete repair itself? Page 58



## Plus

The prince who became a pauper. **How effective is a democratic government?** How long can you go without sleep? Why do older women prefer shorter hair and when was the first traffic fine issued?





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## HAPPY NEW YOU

**Revealed:** The secret  
to sticking to your  
New Year's resolution p.10



**Food for thought**  
Can you tell what's in  
this dish? See page 47  
for the answer

## Technology, history, science plus:

- Strange Christmas traditions
- **Making concrete indestructible**
- The life of an enlightened prince
- **The best ways to stay hydrated**
- Who killed Batman's parents?



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